EXPLORING LONG CYCLES

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edited by George Modelski

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Preface

Why care about long cycles, the rhythm of global politics? Most pertinently, because they organize international relations in the past, and they clarify the future. In a unique fashion, long cycles illuminate the position of the United States and that of the Soviet Union. They order our thinking about global problems, and they might suggest ways of coping with nuclear war. More generally, because they already tell us a great deal about how the world works and promise to reveal more in years to come.

This particular book expedites the study of long cycles both through synthesis and through analysis. It offers general reviews of the field to provide insight into contemporary thinking: these critical appraisals include full references to the relevant literature. Other contributors represent analyses of selected topics, including a thorough discussion of the relationship between long cycles and the theory of hegemonic stability.

Fellow students of international relations, teachers, and researchers in the community of international studies are the primary audience for this book. The audience, however, also might include all those who wish to understand the rhythms of large-scale social systems and their unfolding over time. Students in particular will find useful the reviews of the field, the bibliographic materials, and comparisons with competing approaches. All those who wish to keep abreast of developments in this rapidly moving area will gain from these discussions and reviews.

This is the first book of the series, *Long Cycles: Studies in International Relations*. Building on the work of the first book, the series will carry on the project of reporting state-of-the-art work in long cycles research, but it is expected, too, that each production will focus on a distinct theme. The second in this series will examine global wars, a topic central to long cycles. (Potential contributors to such a volume may wish to enter into correspondence on that subject.) Each volume will maintain also a continuity with the other books in the series.

Thanks are due to all those who made this first book possible: to the publishers for firmly backing this new line of intellectual endeavor, the contributors for their ready cooperation, the department of political science at the University of Washington for its logistical and secretarial support, and to Cheryl Mehaffey, in particular, for her careful processing and expediting of the typescript.

George Modelski

1

George Modelski

The Study of Long Cycles

This introductory chapter serves two purposes. First of all, it lays out a brief assessment of the current state of the study of long cycles; it examines the main questions that research in long cycles attempts to answer, and it reviews the progress attained so far in answering them. Such a periodic review of the state of the art is a necessary part of any sustained inquiry, and it is complemented here by the full "Bibliography of Long Cycles, 1975-1985" that is found at the end of this volume.

Second, the essay shows how the contributions that make up this collection fit into the investigation of long-run regularities in world politics. The book brings together a number of explorations that add to this new field and enrich it in a number of directions. In this introductory chapter, we shall see how and why the studies brought together here in fact do that.

The Rhythm of Global Politics

The study of long cycles is the study of the rhythm of global politics. Its primary reference is to the temporal dimension of the political process and the degree to which that process is differentiated through time. Because of its focus on time, it belongs to the field that might be labeled "chronopolitics," but, in as much as its primary concern is with large-scale systems, the full designation could be "chronomacropolitics" (the study of the rhythms of large-scale political systems). The principal allusion here is to chronobiology, where the investigation of circadian and other rhythms has taken off successfully in recent years.

The concept of chronomacropolitics makes it plain that the study of long cycles forms part, *inter alia*, of the more general field of periodicities. Such periodicities may pertain to physical, biological, or social systems, and arguably much may be learned by examining long cycles in that context. The authors of Chapter 2 of this volume, Arthur Iberall and David Wilkinson, call this field, in a physics analogy, spectroscopy ("the identification of levels and scales of temporal processes in a system") and proceed to argue that "cyclic processes are the dynamic spine or skeleton of social systems." They examine in some detail the periodicities exhibited by the human organism, and show how a variety of basic social and political patterns is related to them. We need not necessarily accept their position that these processes are best understood through a "social physics" paradigm before gaining an appreciation of the omnipresence of time-patterning in the natural world and of the possibility that the long cycle might be one of these patterns.

The long cycle is, just like biological periodicities, a rhythm of a natural system--in this case, a social system. It describes the pattern of major wars that have punctuated the experience of the modern world system of the past half-millennium, and the coming and going of leading powers that have been intimately involved with these wars. In a real sense, the long cycle has been the very essence of world politics, the central process of its "high" politics, and the motor of much else.

What is it that we need to know about long cycles? The basic questions, we submit, are the following:

1. Do long cycles exist?
2. What explains long cycles (assuming that they do exist)?
3. How do long cycles interface with the rest of the world system?
4. How does the study of long cycles relate to other approaches to international relations, and to world system analysis?

Do Long Cycles Exist?

The existence question is the most basic for long-cycle studies. If our initial concept of such cycles is "a sequence of events that repeats in a regular pattern," then the initial tool for identifying such a pattern has been the "periodic table" of long cycles whose first version appeared in the 1978 article and whose purpose is to show, as rows, a series of events constituting one long cycle and, as columns, uniformities across cycles. Such a table is at once a means of ordering data about the past and also of constructing a framework of prediction, or expectation, about the future. The framework is constituted by the four cycle-phases and, on its basis, it is possible to ask whether evidence from global politics does or does not bear out our expectations. When filled in, such a table neatly summarizes a half-millennium of international relations and also informs us about the length of cycles and their phases, the beginning of the entire system, and the way it might extend forward.

For Shumpei Kumon, who in Chapter 3 undertakes a general review that was originally written for a Japanese audience, the periodic table is the basic framework that lends coherence to the entire analysis. He uses it as an expository device, and goes on to build from it his own conception of the evolution of the modern world system.

Over the years, the periodic table appeared in many long-cycle papers and it underwent changes of emphasis and detail but, overall, it remains a fundamental tool of analysis and a suggestive framework for putting together both data and narrative accounts of an extended stretch of the working of global politics. Table 1.1 displays this arrangement of data in its "systemic" mode, as it first took shape from conventional histories that agree on starting the modern world at about 1500 A.D. (A more recent development, the "learning mode," with new names for the four cycle-phases, is presented below.)

The periodic table organizes "system-time" (Thompson 1983a) or, more precisely, the time structure of the global political system, and of the global system as a whole. It does not predict phases of exactly identical length of

Table 1.1 Long Cycles in Global Politics (systemic mode)

	Phases		
Global War	World Power	Delegitimation	Deconcentration
	Events		
Major Warfare	Role Assumed by		Challenger
	Portuguese Cycle		
1491-1516	1516-1539	1540-1560	1560-1580
Italian and Indian Ocean Wars	Portugal		Spain
	Dutch Cycle		
1580-1609	1609-1639	1640-1660	1660-1688
Spanish-Dutch Wars	Netherlands		France
	First British Cycle		
1688-1713	1714-1739	1740-1763	1764-1792
Wars of Louis XIV	Britain I		France
	Second British Cycle		
1792-1815	1815-1849	1850-1873	1874-1914
Wars of French Revolution and Napoleon	Britain II		Germany
	American Cycle		
1914-1945	1945-1973	1973-2000	2000-2030
World Wars I & II	United States		Soviet Union

calendar time, but it suggests that both phases and cycles should be of roughly comparable length--that length probably having a relationship to the generational cycle. It does predict a sequence of events (or phases) for the system and the evidence entered into its boxes supports or fails to support such a prediction.

This "periodic pattern of events" concept, in effect a rudimentary method of measuring system-time, has been the first method of organizing and testing data about long cycles. What about the other basic dimensions of the global polity? They too should show evidence of periodic fluctuations, possibly of even a more rigorous character, because it is that system--the global polity--which experiences cycles.

What, other than system-time, are the basic dimensions of global politics? Let us posit the following three: polarity, coalitions, and (macro)conflict.

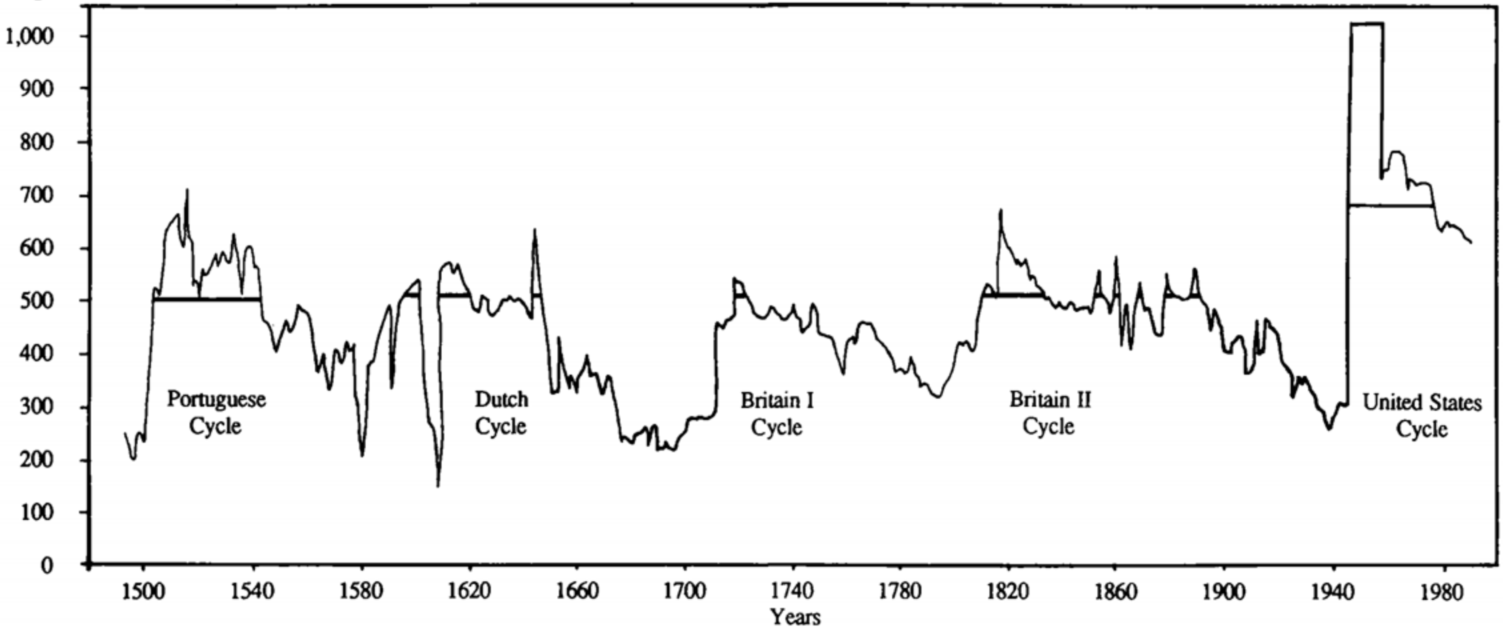
The dimension familiar to students of world politics, at least since 1945, is polarity. It is a prediction of the theory that over each long cycle the global political system moves, along the polarity dimension, from a position of low- to high- to low-power concentration. The theory also suggests that the most appropriate indicator of power at the global level, over the entire timespan of modern world politics, is sea power; it is the most important form of capacity for global reach and, in the most recent decades, sea power is to be interpreted as sea-air-space power. Land power, by contrast, is most prominent at the regional level.

The testing of the polarity proposition has been a high-priority goal of long-cycle studies for a number of years. The first results were reported early by Thompson (1980) and the entire project is outlined and justified in a forthcoming book (Modelski and Thompson 1987). Figure 1.1 reports the principal finding of that project: sea power concentration, hence global polarity, peaked at regular intervals five times in the past 500 years; each peak was followed by a decline, and then a recovery at the close of the next global war. This figure is a basic test of long-cycle theory: the prediction of cyclicality is fully vindicated, with an accuracy that is just short of astonishing.

The coalition-political community dimension is less well understood and has not been subject to such testing to date. But we do know, *inter alia*, that the global war phase of the long cycle has been the phase most prolific of explicit and spectacular coalitions. Systematically compared, these coalitions show structural similarity, persistence, and predictable change over the entire timespan of modernity (Modelski 1984). There is strong evidence, moreover, that certain political relationships serve as core alliances and, as such, as elements of stability and continuity for the entire system, and that they mediate transitions between cycles.

The last set of data concerns conflict in the global political system, which may be termed macroconflict. Long-cycle analysis predicts that one of the four cycle-phases harbors the most severe conflict, that which takes the form of major warfare and makes it the traumatic but crystallizing event for the entire system. The other phases produce lesser or different kinds of warfare and conflict. The data supporting these conjectures are now substantial.

Figure 1.1 The Long Cycle, 1494–1993



Probably best supported is the series of studies by Rasler and Thompson (1983, 1985a, 1985b, 1987), which, by extensive data collection and statistical analysis, conclusively demonstrate that global wars differ fundamentally from other wars by the type of impact they exert on the political and economic systems of the major powers. After a full review of the literature, both Levy (1985) and Thompson (1985) reach the conclusion that the notion of a special class of wars is well supported. The Thompson *v.* Chase-Dunn debate in the *International Studies Quarterly* (1983) gives that notion additional substance. Data on war fatalities (Modelski and Morgan 1985, 398) indicate that, as expected, global wars have been exceptionally productive of deadly violence.

One last form of testing for the existence of long cycles looks into the future. If such cycles exist, then they ought to serve as a basis for making predictions. That is why the "Global Politics Scenario for 2016," which concludes the present volume, falls into the category of tests too, although its meaning is not exhausted by that. A capacity to organize our thinking about the future is an additional useful byproduct of the study of long cycles.

The existence question in long-cycle research has been a substantial, but as yet unfinished, undertaking. Other tests are necessary--in particular, a more thorough exploration of the coalition dimension, and an investigation of conflicts. But, among the byproducts, there has been a resolution of the puzzle about the contrast between nineteenth- and twentieth-century warfare (Thompson 1983), and substantial new light shed on the question of stability of bipolarity (Thompson 1986). The evidence now at hand suggests that long cycles do exist and that this knowledge is vital to helping us to grasp world politics.

What Explains Long Cycles?

The question of explanation is of cardinal importance but, understandably, complex. It is now fairly clear that the best framework for conducting an explanation is some version of system theory, and that the long cycle may best be regarded as a form or manifestation of the working of a system--the global political system. That, in turn, implies an ability to distinguish the global polity from other subsystems of the global system, as well as from regional and national systems. The generality of the system concept is an element of great strength: it makes it possible to argue that all systems, or at least all complex systems, behave alike (Laszlo 1972) because of similarity of structure or similarity of problems. Chapter 5 of this volume spells out the elements of this "systemic" approach to the understanding of long cycles. Its novelty lies in its depiction of the long cycle as a process governed by positive and negative feedback loops, and its determination, in relation to them, of the dimensions of the global political system.

Originating in the 1930s, the cobweb model was, for economists, a useful device in examining the behavior of markets that were characterized by inelasticities and, more generally, for studying fluctuations of the economy at large. Analogously, the global market for the public good of leadership might also be thought of as one in which the inelasticities in the supply of, and the demand for, leadership might be those conducive to instability (supply being a function of the availability of power resources, and demand a function of community or coalition values). A two-variable model of this kind could well be a useful introduction to the problem of fluctuations in the provision of public order. An outline of that model appeared in Modelski (1983a), but a full test of it--with the help of two cobweb models--is now printed for the first time as Chapter 4.

A more recent development is the idea of political learning cycle (Modelski 1986a). This learning model of the long cycle builds upon Parsonian macrosociology but gives it a dynamic perspective, one that derives directly from viewing the cycle as (in system-time) a four-phase process, each phase of which optimizes a particular systemic function.

Viewed as a political learning process, the long cycle might then be seen as involving processes, the completion of which brings about a change in the system itself (rather than in the environment), a change that affects the solution of a systemic problem. The learning mode of the cycle involves the phases of clarification, coalitioning, macrodecision, and implementation. These are the same phases we met before, but they are now viewed from a different perspective, not as stages of systemic decline but rather as steps in reaching a solution. For instance, in this view,

Table 1.2 Long Cycles in the Post-European Era of the Modern Epoch (learning mode)

	Phases			
Cycles	(a) Clarification	(b) Coalitioning	(c) Macrodecision	(d) Implementation
	Global problems: political, general	Coalition	Global decision process	World power
1	1850-1873 Post-European transition: Knowledge Revolution	1984-1914 U.K.-U.S. special relationship: Entente vs. Alliance	1914-1945 World Wars I and II	1945-1973 United States
2	1973-2000 Global nuclear war Integration	2000 Oceanic vs. continental	2030 ?	2050

the phase of global war is that of macrodecision, the time when the global polity produces a systemic decision. This leaves the phase structure unchanged, but times each learning cycle to start two phases "earlier" than the "systemic" cycle (compare Table 1.1 with Table 1.2).

Each phase of the learning cycle stands for the satisfaction of one functional requirement of the political system by the action of one generation and represents the solution of one major problem. What is more, each long cycle is one phase of a superordinate movement, that of the global system as a whole; that too is a learning process, coping this time with general global problems. This makes it possible not only to view the long cycle as a major social and political process, but it also enables us to analyze and anticipate systemic problems that are predicted by the learning model. Table 1.2 presents the two most recent learning cycles, together with their "problems" and the way they were processed.

Interface Analysis

We may take it as axiomatic that the global political system is related to (or interacts in some fashion with) all the other subsystems of the world system, etc. In principle, we need to inquire into all these interactions; in practice, and for the present, we can do no more than single out for attention a few of the more prominent lines of interchange.

Currently, the most prominent of these is the politico-economic interface, in recent years particularly enshrined in studies of "international political economy." Suspicions that the long cycle is related to international economic processes have been strong almost as long as studies of these matters have been around, and suspicion has fallen, in particular, on the Kondratieff wave, a process of the "capitalist world economy" first identified by a number of Marxist scholars but, on the whole, neglected by mainstream economists. Following upon earlier work by Joseph Schumpeter, studies by Walt Rostow have pointed to the bunching of the periods of economic expansion in times that, upon analysis, may be seen to alternate with times of political activism in the form, among others, of warfare (Modelski 1981, 1982). The periods of expansion are primarily those of the global economy, because that is the economy most directly affected by significant innovation and because such innovations have much effect on international trade, investment, and finance (Chapter 9).

Equally important, although less well understood, are the linkages between the long cycle and the global community-in-becoming, and with the global "pattern-maintenance" system. The first is likely to be mediated by the party systems of the world powers that process global problems, by party debates, and the alternations in power. That the evolution of party systems is linked with the long cycle via successive world powers has already been demonstrated (Modelski 1983c). What needs to be shown more fully is how precisely party competition and government succession, via critical elections in the world powers, promotes the global process. The second linkage, on the other hand, is likely to be related to the generational process by which the global system reproduces itself across system-time. That, too, remains to be explored more fully.

The long cycle, finally, may be viewed as one phase of a larger, also four-phase, global-system process or, more precisely, as a mechanism that times or paces itself by selecting the world power that becomes its principal carrier (Modelski 1987). This global-system process might be a learning process, hence understandable as a predictable sequence of phases, each optimizing one global-system function. In this light, the evolution of the global system, since the mid-fifteenth century, has been a succession of four (macro)phases, encompassing the European era of the modern world system followed, since about 1850, by the first two macrophases of the post-European era (Table 1.2).

One other key linkage is that between the global political system and the regional systems of the world system: political, economic, etc. Failure to distinguish between the global and the regional levels of interaction makes the subject of international relations more complex and confusing than it needs to be. The distinction becomes important, e.g., when we try to account for the role of Europe in conventional diplomatic history in earlier centuries--a role in which the global and regional strands are seldom segregated--yet becomes crucial in the explication of, for instance, the workings of the balance of power in the European era of the world system. Similar clarity needs to prevail in the classification of powers as either global or regional. Most generally, we classify powers as global when they dispose of substantial capacity for global reach, that is, navies and air-space organizations. Armies, as noted, produce forces that, if large enough, create a regional impact; this is so because extraregional power projection obviously requires capacity for sea-air mobility. Following an extensive review, the list of the nine global powers of the past half-millennium has now been finalized with a good degree of confidence (Modelski and Thompson 1987). None of this exhausts, but rather introduces, the complex problem of global-regional relationships that demand systematic treatment.

There is also the relationship between the long cycle and national political systems. We know that there is a link between the long cycle and the rise of nation-states, mediated in particular by the world powers (Modelski 1978). But that, too, is only a beginning. For each national system we should be able to point to significant interchanges, as, for instance, in the case of Japan (Modelski 1983d); this problem calls for systematic treatment.

There is, finally, the question of linkages between the long cycle, the world system, and culture. One exploration of that linkage is the study of dependency generation and reversal in the modern world system (Modelski 1983a). More work is obviously called for at this level.

Related Approaches

One last way to delimit a field of study is to review its relationship to similar and competing approaches. We can do this by comparing and contrasting long cycles to other perspectives on the study of the world system, in general, and international relations, in particular.

The view that the study of long cycles is a form of the study of world systems is put forward in *Competing Approaches to World System Analysis* (1983). William Thompson points out three common denominators of world-system analysis: (1) that a world system exists; (2) that world-system structure and its critical processes explain behavior within the system; and, (3) that approaches to studying it need to be cross-disciplinary. He finds that both the (hyphenated) "world-economy" perspective and the (unhyphenated) long cycles perspective satisfy these criteria. In as much as long cycles are manifestations of the global political system, and as the latter is a component of the world system, then the study of long cycles naturally forms part of world-system analysis.

Another way to consider the study of long cycles is to compare it with "hegemonic stability theory," as advanced by, e.g., Charles Kindleberger, Stephen Krasner, or Robert Gilpin (1981), and as interpreted, e.g., by Robert Keohane (1984, Ch.3). Table 1.3 lists the principal tenets of that theory, most recently called "hegemonic transition," and compares them with the relevant generalizations of the long-cycle approach. Overall, the impression is one of considerable convergence: both approaches assign a central place to the concept of leadership/hegemony. Both agree that Great Britain and the United States are among the relevant cases, that the role needs to be grounded in significant resources, and that among the problems the holders of that role need to address are those arising from the operation of the international economy.

But there are also significant differences that go beyond matters of nuance and interpretation. The long cycle makes us adopt a longer-run perspective in the light of

Table 1.3 Hegemonic Stability and Long Cycles Compared

Hegemonic Stability/Transition Theory	Long-cycles Perspective
Central concept: hegemony	Central relationship is between leadership and challenge
Hegemony is preponderance of material resources	Leadership is function of supply (or input factors) and demand for solution of global problems
The two relevant instances are those of nineteenth century Britain and twentieth-century United States	Relevant cases include, besides these, eighteenth-century Britain, Netherlands, and Portugal
Hegemony creates international order, including international regimes	Leadership solves global (political and general) problems
Hegemony is required for maintaining international order, including economic order	
Hegemony creates free trade	The relationship between leadership and free trade is variable; the evolutionary trend is toward less monopoly

which the concern must be not just with leadership, but also with the challenges to leadership, and with the tension that inevitably arises between them--a tension that imparts a dynamic quality to the entire process. There is less emphasis on purely material resources and more concern with organizational and strategic questions, and with the important "demand" side of the equation: what the problems are that leadership is expected to resolve. The universe of relevant cases is larger, too, and includes eighteenth-century Great Britain, the Netherlands, and Portugal, and that makes for better generalizability. Finally, the relationship between hegemony/leadership and the international economic order is less simple than suggested by the theory of hegemonic stability (or transition).

Given the points of convergence and divergence between these approaches, a close examination is indeed indicated and that is the subject of three other chapters that form part of this book. For David Rapkin, the point of reference is the concept of leadership, which he sees as quite close to that of hegemony. He emphasizes the centrality of that concept to the study of all politics, but reminds us how much more remains to be done with it, crucial as it is, *inter alia*, to the understanding of the U.S. role in world politics.

Daniel Pearson's work is a study of the global economic order of the eighteenth century that centered upon Great Britain, and it is designed to show that the hegemonic stability analysts' self-limitation to the nineteenth and twentieth centuries could appropriately be reconsidered. For him, the continuities between the eighteenth and nineteenth centuries are so significant that any future analysis must take these into account. Moreover, his study sheds light on one of the most interesting questions in long-cycle studies: How did Great Britain engineer a transition from her first to her second cycle?

Suzanne Frederick, in Chapter 8, examines the claim that hegemony has invariably been associated with free-trade policies. She finds the relationship not so simple. In the five periods of world-power leadership that she reviews, "tariff reductions and systemic expansion of trade tend to occur with the deconcentration of global capabilities"--that is, in times of declining hegemony. This suggests the interesting thought that "trade liberalization may be symptomatic of a decay in systemic political leadership rather than fruition."

Viewed together, these chapters lend support to the view that the long cycle brings a more general and more broadly grounded approach to studying these important questions. That is because a theory or perspective may also be judged by the questions that it provokes and the quality of the answers it gives to these. The study of long cycles raises, among others, such questions as: What is the source of future world leadership? Must there be another global war?

On leadership, long-cycle analysis suggests no single model of decline. Rather, it directs our attention to the several forms leadership assumed in past cycles, including the experience of Great Britain in the eighteenth century (Chapter 7), in which an encore performance was successfully engineered. Chapter 9 has more to say about the conditions of leadership in the future.

On global war, long-cycle work does not imply at all that another global war, let alone a nuclear war, is inevitable. On the contrary, systemic analysis (in Chapter 5) makes it plain that global war is one form of the process of macrodecision for which alternative forms can presumably be found. But it does warn (Modelski and Morgan 1985) that such alternatives need to be established in the none-too-distant future.

This introduction shows that much has been done on long cycles; their existence, their meaning, and their place in the world at large are clearer now. The additional contributions we have brought together in this book extend the study of long cycles in a number of directions. The Iberall-Wilkinson account of organismic periodicities places long cycles within a broad framework of the sciences. The next three chapters deal with the long cycle as a whole. One analyst, Kumon, examines it and appraises it against an explicit view of modern evolution as moving into an age of information; another tests it against empirical data, and the third gives it the backing of system theory. The other chapters center around leadership and hegemony. Rapkin's fills out and enriches the concept of leadership; Pearson and Frederick review aspects of hegemonic stability theory in light of historical and empirical data suggested by the study of long cycles. The final chapter shows what long-cycle analysis can tell us about future global politics.

On the evidence of this volume, what is new in long cycles? Maybe it is the following: an increasing acceptance of an evolutionary epistemology; a systematic critique of hegemonic stability theory; an improved capacity for looking into the future; and better answers to the crucial questions of the age, especially on global nuclear war.

2

Arthur Iberall & David Wilkinson

Dynamic Foundations for Complex Systems

It has been argued elsewhere (Wilkinson and Iberall in review, 1986) that physics (social or systems physics) can provide fundamental concepts for the social sciences, among them political science. One of these foundational notions is that, beyond *morphology* or *microscopy*, lies *spectroscopy*. Microscopy is the identification of the various levels of form in a system; spectroscopy is the identification of the various levels or scales of temporal processes going on in a system. We here present an illustration of how one might initiate a political spectroscopy.

Some Physical Preliminaries

The treatment of the processes of *organization, transformation,* and *change in space* and *time* are the hallmarks of the science of physics and its applications. In a prior note (Iberall 1985), a social physics for modern societies was outlined. A physical context for such a theory, in the form of some elementary physical principles, may be found in Soodak and Iberall (1978).[1] The foundational construct of social physics is based on the physical theoretic of an *irreversible field thermodynamics.* Since these three words may seem completely mysterious to political scientists, we shall first explain them, and then show how irreversible field thermodynamics compels all scientific researchers to seek *periodicities* and a *cascade spectrum* of nested processes. We shall then attempt to locate the social spectroscopy that must guide social researchers, and within that the political spectroscopy that can guide political scientists.

Thermodynamics

Classical Newtonian physics deals with a number of straightforward mechanical interactions between matter components --rigid body connections, elastic interactions, gravitational attraction--involving their matter measures, momenta, and energies. Thermodynamics, viewed commonly as merely the study of heat flow, is not confined solely to pure heat flow between matter components but, as a multilevel theory, covers all interactions including and beyond the purely mechanical. Many of these interactions will not, in general, be mechanically conservative of energy, but will include frictional losses, chemical transformations, and phase transformations.

The major laws of thermodynamics are two: the first law states that energy is conserved in all interactions, but the second law states that, as a result of natural processes, there has to be a net gain in disordered activities. Energetic order is degraded--transformed into lower levels of organization. (Technically, the net entropy--a negative measure of geometrically and energetically ordered processes in systems--of the universe will increase. Whether the disorder increases locally within the system or is diffused out of the system, energy will be dissipated, reduced to a less available form).

Irreversibility

Because all natural interactive processes are dissipative, they irreversibly represent a net gain in disordered activity whose consequences can only be undone at energetic cost. That dissipation is lawfully describable (in an irreversible thermodynamic description) by the transport processes of diffusion, which may include chemical and phase transformation. Because we can describe such dissipative flows, we can track them.

Field

We can track irreversible thermodynamic processes (diffusions) not only in a "lumped" or "contained" form (e.g., as the interaction or exchange of matter and energy in a confined beaker), but also out in an x,y,z,t (space and time) coordinate space. Such a general spatial domain, in which state and change in the coordinate measures of mass, energy, momentum, or action are described by a set of partial differential equations, is considered a continuum *field*.

We can state the expectations of an irreversible field thermodynamics as applied to *any* complex field phenomena in *any* ongoing (changing) operational system. Prototypical complex field systems are the atmosphere, oceans, lakes, rivers, clouds, plate systems making up earth tectonics, dynamics within a star or galaxy, dynamics within a living organism, and now dynamics within a social system (in which the atomistic players also change as the birth-and-death process courses on). The descriptive equation set, when or where it can be derived mathematically, is a nonlinear, partial differential equation set.

Under the conditions we have described--complex field phenomena in an ongoing operational system[2]--we are instructed by the mathematics behind irreversible field thermodynamics that we can expect to find an extensive cascade spectrum of ordered and related periodic or near-periodic processes, and a certain kind of Fourier decomposability of the processes and states into such harmonic components. A strict theory would require a theoretical account of such harmonic components and their relations. Physics, as a discipline, accepts such discovery by either empirical observation or by theory, with the expectation that both accounts can eventually be made to square. At this stage of a social physics, preliminary experimental discovery is perhaps as much as we might expect.

A cascade spectrum represents a descriptive statement that, as fundamental conservations--of mass, energy, momentum, or action, and which may include population number in the living case--flow through the system, fast processes emerge out of slow processes. (A useful catch phrase is that "authority," in a physical sense, just as in a political, ecclesiastic, or secular sense, flows down through the system as "information" flows up through the system). To identify and study such a "spectrum" of processes is viewed as a spectroscopy. The physicist offers two kinds of observations and methods: microscopy--the determination of spatial morphological forms at various spatial scales, and spectroscopy--the determination of temporal processes at various time scales. Social science has developed its microscopic analysis of forms more thoroughly than its spectroscopic analysis of processes; indeed, its process analysis has tended to be nonspectroscopic--a description by periodic, unique causalities of uniquely configured events (even though it is obvious, for example, that, socially, day follows day or that generation follows generation).

Social Spectroscopy

Elsewhere we have expounded a homeokinetic physics of complex systems (Iberall and Cardon 1966; Iberall and McCulloch 1969; Iberall 1972; Soodak and Iberall 1978) whose physical foundation assumes that the form of such systems is hierarchically nested and arrayed. Thus complex atomistic-like entities (atomisms) exist (at every level); in interaction, they make up a near-continuum field. Because of stability considerations, that field breaks up into super-atomisms, etc. (an alternation of levels ...-A-C-A-..., where A equals atomism, and C equals a field continuum (Iberall 1972, 9-13).

For the purposes of providing social and physical scientists alike with a neutral concept, we define a social system as a system of chemically bound atomisms that exhibit an extensive spectrum or matrix of atomistic modes of action. Their action spectrum emerges from the "temporary" bonding, in a considerable number of particularly bound configurational patterns, among interacting atomisms. Thus a group of cells, organs, or people can constitute a social system (as can a system of complex molecules, e.g., as in a cell).[3]

It is, of course, evident that our concern in this chapter is with human social systems. But the purpose of providing the generalized definition we have given is to make clear the basic fact that there will be a spectroscopy associated with every field atomistic level, and the fact that these spectroscopic levels will intertwine. Thus atomic, molecular, cellular, organismic, and human societal process patterns cannot be sharply differentiated and studied in isolation. That this problem is common to all vertically adjacent complex system levels constitutes the social physicist's way of assimilating, e.g., the celebrated "level of analysis" problem in world politics.

Since the individual is the atomistic unit of society, we begin our social spectroscopy with some of the salient spectral "lines" (process frequencies or periods) of the physiological individual. The introduction and identification of a few of these lines may help clarify how the identification of spectral lines in society should be carried on. The fact that a few of the processes have at least a marginal political significance illustrates the interaction of differently timed processes at various morphological levels.

Our spectroscopy is "social," not merely "political." The political system regulates, governs, commands, and controls society. It has its spectra--its characteristic mean durations and periodicities--but these are not drastically different from more general social durations and periodicities, which are often connected by related processes. The political system must deal with all the other durations and periodicities as well, either by adapting its processes to the expectation of the continuity of the social rhythm, or by trying to shift those rhythms, which are soft, toward one or the other end of their normal range (e.g., by trying to entrain them).

We are asserting that properly founded social rhythmicity must be given equal status in social science with structural analysis; we are not alleging that it has no current status at all. Clearly, the story of generational periodicity (how the events of one generation are causally connected to the next) has had some appeal to the historian--note, for example, the commonness of use of the pendulum-swing metaphor. The succession of generations is obvious; it makes a tale relatively easy to tell; it is cross-culturally applicable; it is what connects the kings of England, the pharaohs of Egypt, and the emperors of China. But the generational scale is by no means the only cross-cultural process scale at which a story can be told, change be observed, comparisons made, or control exercised. Indeed, it is likely that each of the spectral process scales that we distinguish in the next section involves a largely autonomous history, insofar as direct causality is concerned.[4]

To allege that sociospectral processes are "largely autonomous" amounts to the assertion that an empirical study of the spectra of human actions will show them to be neither evenly nor randomly distributed over all frequencies, and neither normally nor log-normally distributed around a single central frequency. Loosely speaking, they will instead appear moderately uniformly along a logarithmic scale.

A higher-ordered theory, dealing with fractality and the extent of such fractality, will eventually be required to bind together the sheaf of processes all going on simultaneously. Such a topological theory--a scaling theory of processes--is under process of development for complex systems. But, as yet, we can carry our social spectroscopy no further than to display the process distribution pattern. The data are lacking because social science theoreticians have, by and large, not yet consciously attempted to write nearly autonomous process histories wherein the very weak correlation coupling of these processes may, in fact, appear. (Since physical theory also is, as yet, incomplete in accounting fully for the historical development and evolution of the cascade spectra of complex atomistic systems, e.g., the patterns of weather, social scientists who take heed and begin to write weak-coupled, multilevel social history and theory may contribute to, not just draw from, complex systems physics).

The Spectroscopic Time Scales

0.1 Second

This time scale is associated with the unit of electrical action in neurons as small bioelectric batteries (the bioelectricity emerges from electrochemistry). As such, it becomes a measure of the reaction-time scale of the individual. Bond formation and interpersonal reactions (neural elements within social continuity) may take place at this most rapid of whole-organism scales (Iberall and McCulloch 1969).

Although this time scale may not be the subject of much political regulation, nevertheless its existence is implicit in a great deal of social regulation. For example, it tends to define a causality in the starting and stopping of events (who or what started what), such as vehicular traffic control--when traffic lights should change, what traffic speed to aim for, or what constitutes safe legal driving conduct. Political events cannot take place more quickly than the split-second decision-time of human decision makers.

1 Second

This societal time scaling, by happenstance of biophysical design, is associated with the period of the human heartbeat, a period in the cardiovascular system that is involved in cueing many higher-ordered, integrative processes in the body. It has no particularly general physiological significance, but may be used to illustrate something of the character of physical theory for spectral lines. It can be shown, and also found experimentally, that the resting heartbeat period is, in general, proportional to the one-fourth power of body weight for mammalian species of different adult sizes. The one-second time scale is thus a mechanistic system's parameter in the natural design of mammals.

6 seconds

This, loosely speaking, defines the attention span of the individual (Iberall 1978, 540-541). The reader can verify such an attention process by viewing any of the ambiguous figures--blocks, crosses, staircases, duck-rabbit, lady-vase --and noting the average time of reversal in a long sequence of observations. Verification of this six-second attentional time scale also can be found in the psychological literature (Woodrow 1951, 1230). The result of a great number of experiments is summarized in the statement "The upper limit of the psychological present [for the individual] . . . lies between 2.3 . . . and 12 seconds." One surmises that it is the temporal epoch for percept formation. This period, found also in other animals tested, is presumably determined by one or more compartments in the mammalian brain. It appears in social processes as part of implicitly accepted human cultural phenomena. Politically speaking, this epoch may be the optimal duration of a political commercial. It was found to be the time scale for delivering messages on Sesame Street and the Electric Company programs, independent of age in the young (Iberall 1978).

The preceding scales are socially significant only so far as representing lower limits for quasi-conscious individual decision-making and action. They limit performance at which athletes, musicians, intellectuals, police officers, fighter pilots, and assassins alike can perceive a situation and take minimal action, such as playing a note, reacting, starting to run, or pulling a trigger. Society may wish to make routine, slow down, or prevent a variety of such swift human acts; if it wants to have faster perceiving and acting (problems of real concern in an advanced technological age), it must employ automata.

The next five physiological scales are of social concern mainly because they bear on work organization. The first four scales represent process levels by which mammalian organismic chemistry supports the body's motor-sensory performance. Quite possibly, they color or limit social-intellectual performance. At the fifth scale, we finally reach the limiting atomistic scale for social processes.

90-120 Seconds

This physiological epoch in the metabolic processes of the individual relates to the local relaxational time scale for tissue oxygenation and, as such, is the empowering scale for significant muscle-organized motor action. Socially speaking, this scale may represent a time limit on peak performance of difficult tasks, perhaps intellectual as well as physical, e.g., spontaneous oral production and aural comprehension of complicated social or political interactions. One may conceive of studies directed at discovering the transition from biochemistry to socially biased activity.

5-10 Minutes

This appears to be the relaxation time for the accommodation of blood-flow rate supportive of an extended body task. It is probably socially significant only in work time-and-motion studies, and work-station and work-process organization but, again, it may have social-intellectual implications for actions or decisions.

20-40 Minutes

This is the likely relaxation time for carbonate (acid-base) balance in the human organism. All of the actions of the body's organs have contributed to the biochemical disequilibrium (redox), which the carbonate compartment in the blood reequilibrates. This time scale significantly relates to the capability for social attentivity.

It may be noted that there is no one-hour physiological cycle; what comes closest is a biologically significant ninety-minute scaling, that associated with rapid eye movement (REM) during sleep (and surges of activity during the wake period). The hour and the minute, unlike the second, the day, and the year, seem to be artifacts of intellectual convenience (e.g., the convenience of a scale of sixty), without physical or physiological justification.

2-4 Hours

At this cyclic time scale, thermodynamic equilibrium for the whole body can be found (Iberall 1960). Among a number of equivalent formulations of the second law of thermodynamics is one that assesses the effects on the environment of a system and its working substances (e.g., the chemicals involved in a cycle of a refrigeration system) being taken through a cycle in which the system's final state is a restoration to the initial state, as, for instance, via a period or cycle of performance. Maintaining so-called homeostatic equilibrium by the body's metabolic machinery during the performance of a sustained task by drawing from stores involves such a cycle, during which work may have been done and energy will have been dissipated. Whole-body thermodynamic equilibrium cannot be found for any period of time less than two to four hours; its existence is acknowledged by the use of state averages taken over such a period or cycle of performance. The two- to four-hour scale is common to all mammals as the time scale for major tasks (e.g., a major work epoch). It likely represents a process of daily metabolic regulation triggered by cortisol (Weitzman et al. 1971, 1983).

This is the first microscopic scale that is socially significant outside the small group context. At every sociospatial scale, from individual through family, hunter-gatherer band, farm and village, to urban settlement, the earth-day is fragmented and supplied with rituals and institutions by which human actions, e.g., marketing, eating, praying, resting, transporting (Iberall and McCulloch 1969), are regulated.

The regulating functions of society tend to be organized around time chunks of this two- to four-hour thermodynamic equilibrium epoch. As one might see in cortisol pulsing (Weitzman et al. 1971, 1983)--as opposed to, say, the faster fear-fight-flight reactions that are likely tied up with adrenaline at the near-two-minute scale--the day's events are fractured: chemically, not mechanically, driven into segments, e.g., sleep, work, foraging, and interpersonally attending segments. That rhythm of daily alternation, without being mechanically clocked, has an epochal character of this order (Iberall and McCulloch 1969). Restaurants, transportation systems, department stores, markets, and cities are structured and operate with awareness of these process-times; so are armies and state institutions and functions, such as policing and other public-regulating functions.

24 Hour

The day-night cycle determined by the earth's rotation on its axis is found in the circadian scale essentially marked within the biochemistry of every living organism. It represents the first microscopic scale for *physiological* equilibrium in the individual (except for short-lived species with a life-cycle less than a day), and is the beginning of general social behavior. Over this scale most, though not all, human *actions* are discharged--in twenty-four hours, essentially all individuals have eaten (replenished stores), slept, worked, voided, etc. (Iberall and McCulloch 1969).[5] The sex cycle is a notable exception.

The prudent ruler (whether of family, band, settlement, city, corporation, or nation) does not attempt to control, nor even account in detail for, the outpouring of *action modes*.[6] At most, he or she should only try to, and can perhaps hope to, orchestrate that outpouring. Rulers gate, valve, channel, and orchestrate rather than perform or control the emerging daily flow of human actions. The wise ruler knows or must know that locally all these human actions have to take place, have to be allowed to take place, and have to be supported in taking place. Understanding reality is prerequisite to prudent governance. For instance, public resentments, fears, or uncertainties should not be allowed (and normally are not allowed) to go on for much more than one day or so; soothing counter-rumors have to be released (and are released) at that scale, which becomes a propaganda turnover time measurable in news media production schedules.

Between the two-to-four-hour scale (that is, by a number of such two-to-four-hour segments) and the twenty-four-hour scale, much of the local social regulation has been accomplished. Urban settlements with their rituals and institutions are designed to take the daily action spectrum into account.

3 Days

Although the action spectrum is largely discharged in a day, not all balances are achieved physiologically. For example, copulation in humans doesn't take place every day--whereas voiding most likely has. Its nominal time scale (via the sex hormones) suggests discharge at more nearly three days (performance limited by the male).

A physiologically more significant balancing process exists at this time scale. Body water balances in the body in about a three-day cycle (Iberall et al. 1972) within an extravascular, extracellular compartment, possibly via thyroid hormone--hormones are the chemical regulators or "escapements." This epoch may enter into social phenomena at somewhat longer periods--the social week (at times five days, and other times seven days) may have a weak biological determinant related to the three-day epoch. In any case, the three-day epoch also seems to be a significant determinant of the miniscale for social decision making. This probably occurs as a result of neurophysiological processes, of a brain function related to the biologically entrained earth-day.

It is clear that man does not perform a simple chain of mechanistic actions tied tightly to his circadian day. We tend to see, as a characteristic highly accentuated among humans, that man decides and must decide what to do with each day. Most primitively cast, this is the question of whether to perform tomorrow the same routine pattern that one performed today, or to do differently. If humans had no memory function and no elaborate decision-making apparatus (the central nervous system), one would expect the kind of result one gets with coin tossing. The choice for each day would be effectively independent. But humans have memories associated with their action spectrum. What emerges, instead, is a weak cycle-of-three (or so) process. Some sort of memory function carryover *has* taken place. But the result of that elaborate decision-making apparatus has turned out *not* to be that elaborate. If yesterday went well, why change; if yesterday was bad, should one change or try again?

One finds this kind of memory function carryover in stock market fluctuations and in those of daily trade. That is, as a result of daily decision-making, practically binary in form, an approximate three-day (or so) cycle emerges, because memory introduces at least some pair correlation between days. In fact, a socially viable group (one containing a mix of human capabilities at sizes between, say 25 and 500), when exposed to the task of living together, will have begun to form significant bonding and will have begun to sort out a program of actions and some rudiments of command-control rule in a period of about this time scale. As an academic illustration, massive lecture classes are rarely held less frequently than twice a week, presumably for fear of memory-loss and decomposition of the social whole.

30-90 Days

Another weak cycle of a different kind of causality exists at about the thirty-sixty-ninety-day scale. It most likely has a physiological (biochemical) base, and it emerges socially as a mechanism for tying the organism to the seasonal variations (Strumwasser 1971). Its physiological base is probably the turnover of molecular constituents, particularly centered in the central nervous system. Schoenheimer (1946) demonstrated that all molecular constituents in the body turn over; the average time scale for all ingredients is about a month, with considerable spread. The spread is much narrower in the nervous system--for example, a month scale is a major repair time scale for brain injuries.

It seems quite unlikely that there can be a perfect turnover of all of memory and point of view of the individual from epoch to epoch (memory, after all, has to be stored in some chemical molecular form, presumably dynamic). We conjecture that this turnover period is a major scale for fluctuations between an individual's major psychological states (Iberall and McCulloch 1969; Iberall 1978), and also that it emerges as the scale at which social "mood" changes by entrainment from individual to individual.

Our conjecture is that the major mood fluctuation is between an "anxious" and "euphoric" mood. We submit that the organism holds a world-image of a satisfying state. In a euphoric mood, the organism responds to deviations from that satisfying "image-ideal" state: the progression of actions and cognitions is driven leisurely by the perceived deviations from a mentally held view of what is satisfying. Individual motor-sensory acts and thoughts are driven mainly by how far operating conditions are from the ideal state (e.g., whether it is warmer or colder than desired; whether the gastrointestinal tract is more or less full than desired; whether the level of excitation is more or less than desired). On the other hand, when switched to an anxious or dysphoric state, the organism has "jittery nerves" and responds to environmental fluctuations, to *events* rather than to *conditions*, that is to the derivative action of images of the state variables out in the environment (as a distribution function of such jittering changes). The sequencing of actions and perceptions is "jittered" or "jitter-driven" in the anxious mood because every passing event and signal now receives special interpretation. We surmise that these two image states are held for perhaps a thirty-sixty-ninety-day epoch, pulsed slowly by an integrated memory of recent changes. Thirty to sixty to ninety days is thus an emotional-intellectual scale.

Note that this time approximates the seasonal scales of the year. The simple conjecture is that this process time scale can easily be entrained by the ecological changes of wet-dry or cold-hot, which essentially strongly drive all other biological species. But beyond that, the ruler, administrator, or executive finds himself exposed to changes in which he or she can only hold or develop coherence in the social group for this kind of few-months period; we submit that rulers tend to sense and steer by this scale intuitively. The memory function has difficulty in holding sharp images, including intense emotions, for much longer. This is the longest scale of "spontaneous" political events and moods within a nation, e.g., waves of war hysteria or revolution hysteria. Lefebvre's *The Great Fear of 1789* (1982) documents vividly how a wave of public opinion formed and condensed throughout France in a period of about a month before the French Revolution; many studies of the outbreak of World War One find it necessary to treat in detail only the decision period from 28 June to 6 August 1914, relegating the previous centuries to the background, because the war mood formed in a little over a month.

The thirty-to-ninety-day epoch is a measure of a process in the individual that is entrained, through social interaction, in the larger society, for instance as a measure scale of public opinion manipulation. Whereas social and political propaganda and manipulation of outlook has been demonstrably practiced by leaders all through recorded history, the tools to effect these results were significantly complemented by printing, then by radio, and most compellingly by television (with its total capability for immediacy) operating through the most vulnerable sensory pathway, the visual (Iberall 1973a). We now have twenty years of very elaborate and highly supported experiments in opinion manipulation. The monies spent in public opinion research and development far exceed, without doubt, all of the monies spent on the so-called scientific crusade against cancer. Yet, despite all the expenditure on manipulation, the director of the *Los Angeles Times* political polls concludes, from extensive polling experience, "Any poll taken more than six weeks before an election is a waste of time as far as learning anything [is concerned]" (*Los Angeles Times*, 10 June 1985).

Whether an adequate neurophysiological model for the temporal process has or has not been adequately detailed, it seems to us, from both passively and actively driven social events and processes, that any coherent outlook in a person or group is subject to excitation or decay at this time scale.

1 Year

The year scale, presenting the seasons, originates from the revolution of the earth about the sun. That scale is embedded biochemically in the entire ecological web, from the lowest photosynthesizers on up. Since man is tied tightly to plant and animal species for food supply and many other material and energy usages, this scale becomes a dominant one for social processes. Essentially all social planners, national, corporate, or local, pay careful attention to this scale. It thus becomes one of the essential miniscales for political and economic planning.

The physics of an atomistic ensemble, seen as a field process, is dominated by the characteristic "factory-day" scaling of its atomisms. For a simple gas-like ensemble, that "factory day" is measured by one time scale, its atomistic collisional relaxation time. For more complex atomisms, the "factory day" may involve a sequence or nesting of internalized time scales, for which the longest significant action time or times will likely dominate.

Whereas the fundamental conservations of mass, action, and energy are probably determined by the "factory-day" of twenty-four hours or so, a fourth (demographic) field variable of population number (which, we have argued elsewhere, is a renormalized conservation, maintained by the chemical potential of the on board genetic code and expressed through the sexual reproduction action process) is not determined by a "factory-day" of less than a year or so.[7] Thus, while the social process begins with a day (as a scale for practically all actions of the individual), it is not completed among living human social atomisms (as a social molecularity) in less than a year. This reflects the character of a general correlation between expanding form and function. The more inclusive the field atomism, the more extensive the schedule of processes.

With human settlement via agriculture, technology, and an extensive division of labor utilizing technological tools to amplify human action, man required the management of his speeded up convective processes--of manufacture, of trade--by value-in-trade, a newly appearing economic variable (beginning perhaps ten to twelve thousand years ago).[8] The accompanying emergent processes were posttribal political regulation, control, and warfare. The temporal scale of the year, which is "long" (much beyond an atomistic physiological scale) for the individual human organism, is "short" (a "first" essential miniscale) for the human social field. It is at the year scale that the composite actions of social atomistic groups--as social molecularities--begin to appear.

3-4 Years

Again, this is probably a cycle-of-three (or so) process that depends on a memory function at the highest levels of economic and political organization. One finds this to be both a major fluctuational scale of the rhythm of economic activity (booms and recessions), of trade activity in general, and of the political process, with some in-and-out-of-phase resonance between processes.

Just as the "hard-wired" year is not a seamless mechanical process when it relates to the considerable fluctuations in seasonal subprocesses, the much less "hard-wired" generation scale (which fluctuates more than the geophysical year) has subprocesses, whose political aspects may be elicited by asking, how long *could* the average ruler rule? How long *does* the average ruler rule? What accounts for the differences?

The reader can doubtless imagine an ideal hereditary monarchy, each of whose rulers reigns for approximately a generation, or an ideal elective monarchy where tenure might be reckoned as the life expectancy less a maturation time, say about fifty to seventy years. Actual rule spans, no matter how measured, are markedly less, by an order of magnitude.

We are misled to think of leadership as of generational scaling by the impressive careers of "outstanding" rulers, but their typically long-term tenure is atypical of rulers in general. Political rulers can, in general, neither elect nor be elected to rule a generation; the memory function of the ruling elite and of the ruled populace interferes. Ruler power is curtailed at much shorter intervals--by custom or design (rulers may be expected or elected to serve for a particular period of years), and by intervention (rulers may be deposed), as well as by physiology and psychology (rulers may die or tire of the role). Political tenure of the highest offices tends to average two to six years rather than, say, one year or twenty to thirty years. For instance, Grant (1985) discusses ninety-two Roman emperors and mentions nearly one hundred others over the period from 31 B.C. to 476 A.D., implying, as one of many such illustrations, an average period of political rule of about two and one-half to five years. This short average tenure suggests an implicit, underlying, binary yearly evaluation process with memory and involving weak decision making: Did our leader do well or not? Shall we continue support or should we temper our support? The frequent reiteration of that question is enough to account for the proverbial unease of crowned heads, and the proverbial fickleness of public opinion.

Even in atypically long reigns and tenures, just as the year is fragmented into seasonal and shorter changes, or the day into thermodynamic modal segments of action, the generational scale of a major ruler will still be fragmented by the interpositional scale of many subrulers, who gain and lose confidence (the rulers's rather than the electorate's) at about the same scale.

There also tends to be an in-and-out-of-phase "resonance" of the political and economic processes with the war processes. The frequency of wars, for example, demonstrates both a "small quarrel" scale of about four years (Richardson 1960; Wilkinson 1980) against a background of "large quarrels" in the ecumene at the rate of about a generation (Dewey 1964; Iberall 1973b) to a lifespan (Wilkinson 1985).

20-30 Years

The human generational scale (time from birth to the age for average reproduction), basically biochemically determined, obviously keys the social process. However, a social process could only exist if there is social-force bonding (Iberall and McCulloch 1969). We have argued that in complex systems a social pressure wells up from the interiors of complex atomistic entities (Iberall, Soodak, and Arensberg 1980)--humans, in the present instance. It is from the variety of internal actions in complex atomisms that this social pressure arises.

It is an essential ingredient of a social physics that one can argue physically for the existence of a social pressure; if that were not true then the application of physical science to social science would be very suspect. From endocrine systems, through the action of catalytic molecules, there arises sexual bonding, mother-child bonding and mother-father-child bondings: whoever accepts this proposition has accepted the idea of social pressure welling up from the interior. Beyond these intimate bondings, and via a variety of exchange systems (Iberall and McCulloch 1969), there exists bonding due to congruence, similarity, and empathy of interests. Together, these connecting "threads," all basically electromagnetic-electrochemical in origin, guarantee generational bonding. We would argue that these threads of connection also guarantee force repulsions--hence distinctions between friend and enemy, and neighbor and stranger. Suppose then that one accepts that there must be, and that biochemical bonding is, a biological basis for socialization at this generational time frame. What are its major social consequences?

There must of course be a "progression," a changing of the players in each generation. Just as the memory of our individual selves has to change each few months with the changing of the molecular guard, so the memory of our social selves has to change each generation with the changing of the population cohort. (As the Old Testament points out, "And there arose a new pharaoh in Egypt who knew not Joseph.") The point of view of societal command-control has to change, to fluctuate. One such major fluctuation is the occurrence of large-scale war, whose periodicity must be somehow associated with a generation-to-generation change in perception in the political ecumene. (See, for example, Wilkinson 1980; Iberall 1973b; Wilkinson 1983.) The two major large-scale processes that well up in *settled* social life (e.g., post-Neolithic times), in this time frame, are the intercourses of trade and war.

70-90 Years

The human life span lies in the vicinity of this range (i.e., nominally, three generations, effectively 90 years; 115 years is near to an absolute maximum in a large population). This 70-to-90 year epoch is just at or beyond the reach of the individual. At the two-generation scale, a child's grandparents may provide reinforcing or alternative role models to its parents; its great-grandparents are rarely available to do so.

But at the same time that this epoch derives from the life span of the human individual, it tends also to be the upper limit for the life span of equipment and mechanistic systems (i.e., those that are hard-stressed and not built like monuments to stand up idly with little stress, save by chemical erosion). If one inventories industrial, military, and individual capital goods, one will find it is not uncommon to discover buildings, equipment, and machinery that go back to 1950, prewar 1940, 1930, and even back to 1910. It is rare to find earlier capital stock, except for gutted and renovated building shells and perhaps some machines, essentially all of whose parts have been replaced, like the timbers of Jason's *Argo*, leaving us to wonder if the whole remains the same when all the parts are different. This age span is not exclusively a property of this industrial age, nor is it uniquely American.

From these time-scale characteristics of material bodies there may also emerge the Kondratieff cycle. Investment decisions tend to be linked quite widely throughout an economy. If entrepreneurs tend, as they do, to invest in new equipment at similar exogenously driven wave fronts (e.g., the postwar investments of the 1920s and late 1940s), they will also tend to wear out equipment at comparable times, and entrain endogenous reequipment cycles thereby.

From the point of view of kinetic processes, a three-relaxation-unit, three-generation time scale tends to represent a near thermodynamic equilibrium time scale. One can make such an estimate from Einstein's theory of Brownian motion: in about three collision times, energy equalization has effectively taken place. This has been shown to be true for the mathematically complex Navier-Stokes description of hydrodynamic flow fields. That equation set for flow fields lies at the core of all such mobile field phenomena, whether inside complex molecules, planetary atmospheres, nervous systems, stars, galaxies, or the universe itself. There is thus little physical doubt that it applies to the fluid flux of society. Consequently, one suspects that this seventy-to-ninety-year scale is the macroscale for social thermodynamic near equilibrium. In three generations, the individual has been passed over and the net effects of the lives of all those who have lived them out (the social consequences of all the interacting individuals) have effectively begun to spread out through society.

Beyond the seventy-to-ninety-year scale, the atomistic individual no longer appears, and we can properly speak only of group forces and actions in the species, of sect and party, class and corporation, church and state, nation and empire and civilization, of epigenetic group values that make up the social (partial) pressure of individual groups. This is the spectral level at which one can see the rudimentary elements of a mere social chemistry (chemistry: the making, breaking, and exchanging of bonds among atomistic fragments), which exists independently of the atomistic level within the field ensemble. Among them are mixing-pot phenomena.

Ordinarily, in simple fields (ones which have no extensive time-delayed spectrum of internal atomistic action processes), one would tend to find a sharp separation of solution and nonsolution formation. A difficulty that the social (e.g., political) scientist must confront is that the social milieu is not a "melting pot." That is, people entering the social ensemble do not fully mix and bond by giving up a true, fixed energy of solution; instead, they enter into a mixing pot. The human mixing pot is illustrated by, and largely measurable in terms of, regions of ethnicity. (An ethnic group is not a species, which represents atomistic living organisms that can interbreed; an ethnic group represents those who *do* interbreed.) That human beings selectively, rather than randomly, interbreed produces ethnicity and limits the social solvent to mixing-pot status. But the human mixing pot is not unique or physically strange; mixing pots are already found at the level of large molecular moieties (e.g., protein molecules) among smaller molecules (protein among water molecules). In this situation, there may be faces of the large entities in true solution, and other faces not, so that complex associational processes can take place with or without true solution.

Nevertheless, a sustained mixing of a mixing pot can produce a near homogeneity that, after some critical duration, is not inordinately different from the solution state. The real problem the mixing pot presents is that a much more complex kind of physical description of its dynamics is required; and, the problem presented by society seen as a mixing pot is that, at the seventy-to-ninety-year time scale and beyond, some sort of phase description of social systems becomes necessary.

Following Maxwell's (and then Boltzmann's) demonstration that one can establish statistical distribution function laws for the characteristics of ensembles of molecules in motion in a gas, Willard Gibbs (the great American contributor to statistical physics and thermodynamics) developed a general method of determining distribution function properties of such atomistic ensembles by a statistical mechanics of very broad applicability. In his characterization of such statistical mechanical ensembles, Gibbs identified a canonical ensemble state--a rather sharply defined ensemble of all systems of the same energy and number, each running around within its phase space. A phase space is a presentation of state variables versus their rates of change, for each degree of freedom in a system. The multidimensionality of the Gibbsian phase space for a system reflects the number of atomisms that make up the system as well as the number of degrees of freedom that each atomism possesses. Time in such a "static" presentation is not explicit. (Yet, if one imagines state and rate plotted at uniform intervals of time, one would be watching a depiction of such a system dynamically unfolding--racing--through time.) Beyond presenting the phase space for a single system, Gibbs also presented the phase space of all similar systems of comparable energy and number (in which each such system with its own individual atomisms is performing independent actions). The advantage of this sort of conceptual plot is that it tends to be space-filling, and gives a picture of "density" of occupation in each region of phase space, and thus the probability of finding such systems in any particular region of that space. It provides the basis for estimating system averages.

In a mixing pot, an ensemble of all systems of comparable energies does not fill phase space uniformly in density. Instead it is blotchy, most likely with separated regions. The composite picture of human society in phase space could represent (a) a mapping of "all" of the possible political-economic systems compatible with some energy, population number, and technology constraints (in so-called systems' phase space), and (b) the accessible regions and densities in phase space available for a given system.

Gibbsian systems are viewed as *ergodic*; mixing-pot systems, at best, may be viewed as *quasi-ergodic*. From his physical construct, Gibbs was able to conjecture that the uniform density in phase space, having equal probabilities, also represented regions in which time averages and space averages were equal. This is the ergodic property. Systems whose phase-space portraits are only moderately blotchy are often also conjectured to be quasi-ergodic for the fairly densely occupied--not excluded--regions. One would hope and expect that in time, topologists, who deal with the mathematics behind these kinds of ideas, will suggest better means to treat such a quasi-ergodic, mixing-pot systems theory.

Given a scenario of changes in the vicissitudes of the earth's potentials (that is the actual history, or at least the expected and experimental statistical moment measures, of the atmosphere, hydrosphere, lithosphere, the sphere of geochemical processes, and the sphere of biochemical processes--the biosphere or ecosphere), this seventy-to-ninety-year time scale is suitable for predicting human society's relaxation response to such ecological transformation. (See, for example, Iberall, Soodak, and Arensberg 1980, 511-512.)

200-1200 Years

This is the major scale for macrosocial and macropolitical change, and this epoch averages 500 years. Although this is an epoch that has specific meaning for human beings in post-Neolithic times--settled in place in civilizations with interacting political units and making up an ecumene with interacting economic units--it nevertheless has its precursors. Before (or without) written records, small individual cultures, e.g., hunter-gatherers, nomads, forest cultures, and village cultures, did and do have oral traditions (legends, myths, stories of founder figures, cosmology, creation stories, spirits, gods, and heroes) that are carried along for many generations and many lifetimes.

In our experimental historical sample survey (Wilkinson and Iberall [in preparation]), we were able to ascertain two main facts. Examined for the entire time domain from the first Mesolithic cultures (13,000 years ago) to the present industrial cultures, we find a moving picture of changing field processes involving political change, ethnic change, technological change, or major cultural change, over periods on the order of 200-1,200 years, averaging approximately 500 years (basically distributed normally in a logarithmic sense). Further, we (Iberall and Wilkinson 1984) have been able to show, as an introductory theory to that time (and an associated space) scale, that this "civilizational" space-time scale is an appropriate transitional scale for diffusion, compatible with an earlier hunter-gatherer diffusion rate. In man's earlier, physically gas-like state, human operating groups diffused (a random walk or Brownian-like movement) at the rate of one roaming range (thirty miles) per generation (thirty years). Subsequently, after a stability transition, man, settled in place, continued that same diffusion process in civilization from multiple settlement regions, of about 200 miles (Iberall and Soodak 1978, 18-19), with a "life" time scale of about 500 years (Iberall and Wilkinson 1984). The fact that the 200-1,200-year time scale displays the same diffusion rate as that found for the generational scale suggests that the scaling processes are embedded precisely in the biological-social factors that make up culture in general. Two hundred to twelve hundred years is *not* solely an autonomous political time scale, although its political component will obviously be of most interest to our current audience.

The generality and abstractness of the underlying process suggests that it does not possess the quality of some mechanistic "changing of the guards" or "shifting of gears" as some mechanical clockwork advances. It theoretically suggests the unruliness of man's history, which is found observationally in human history.

Longer Scales

Longer human social time scales of interest that likely do exist, but in which no more than some underdetermined fraction of a cycle has as yet been completed, include global demographic and economic peaking and collapsing, and species turnover. Such human time scales can only be studied conjecturally and via other species' histories.

What the reader should understand about this temporal decomposition into scales is that if he or she elects to study human social history, i.e., its cultural, political, and economic dynamics, at any time scaling, those processes will appear continuum-like, but with their dynamic contours determined by the fluctuating content of the nearby underlying atomistic scales outlined. While each such underlying temporal fluctuation can be stereotyped, its specific form takes place as a locally constrained boundary value problem.

To this general spectroscopic depiction or decomposition we would add one final note of explanation. In seeking to find spectral lines in a cascade spectrum (the nesting and causal connections between process scales), one will have to realize that correlations between or among lines may be quite weak (even almost nonexistent) and causal connections both weak and quite varied (Bloch et al. 1971). One must further distinguish between "hard" resonator types of oscillations (mass-spring or inductive-capacitative oscillations) and relaxation-type (discharging) oscillations.

It is also necessary to distinguish between externally driven oscillations (e.g., driven by the earth's rotation or revolution), and internally (endogenously) generated oscillations. An Aeolian harp in a forest is endogenous, given a wind potential; the "clang-clang" of a flag chain or rope mounted on a flagpole on a deserted shopping mall is similarly endogenous. The ocean tides are exogenously driven, whereas the atmospheric tides are endogenously driven--they are self-generated within the atmosphere, given an external heat source potential. Furthermore, even among endogenous, self-generated types of rhythms, some will be found to be quite stationary with little frequency band width or variation, some will be quite warbling and broad (see, for example, H. Wold's discussion of flexible--stochastic--cycles; Wold and Jureen 1953, 149-168; Wold 1965, 115-166). Relaxation-type oscillations and endogenously driven oscillations tend to be broader, with warbling periodicity; most oscillatory social processes are of such relaxation-type, endogenously driven, "flexible" cycles.

Regardless of how generated, we contend that such cyclic processes are not epiphenomena to be noticed, wondered at, and passed by, but rather the dynamic spine or skeleton of the social system. Description and explanation in terms of such dynamically causal phenomena, not as kinematics but as kinetics or dynamics, will transform social science from its current weak theoretical foundations. Even though causality differs for each line process, the ensemble of spectral lines represents the force of an inexorable social pressure.

An Introductory Process Description

The spectrum we have thus far displayed, a picture of social frequencies, is perforce static. Mathematically, in nonlinear dynamics, one of the first descriptions of the dynamics of a persistently ongoing system is just such a topological picture of its so-called frequency response (e.g., the line spectrum for a heated gaseous system like the sun). A spectrum, static though it may seem, actually depicts a persistently ongoing dynamic system, albeit without picturing the phasing of these spectral processes.

A second description of the dynamics of a system often appears as a presentation of its so-called phase portrait, a description of its state and rate changes (Abraham and Shaw 1982-1985). We are not yet prepared to present a phase portrait of the human world-system. Instead, we shall simply provide an orchestral depiction of the process spectrum, a brief "motion picture" introduction to the operation of the human world social (and political) system in highly stereotyped form.

The individual receives a sensory influx, fluctuatingly presenting the environment and its potentials; he or she returns motor reaction at the 0.1-second scale. Although they can be driven to change more frequently by unusual external cues, perceptions and individual attentive postures tend to form and attention to shift autonomously (endogenously) approximately every six seconds (Iberall 1978).

Integrative body support for bundles of internal perceptions and external body tasks is provided at the two-minute scale (metabolic oxygen support), at the seven-minute scale (blood flow support for regional tissue), and at the thirty-minute scale (pH balance). One is dealing, of course, at all these time scales with perfectly conscious human beings, even though these three scales are automatic and mechanistic.

At the three-hour scale, the human chorus of organs and processes are fully assembled. The choirs sing, dance, and engage in steps in all their socially orchestrated activities: eating, sleeping, working, drinking, voiding, having sex, attending to nature and others, exhibiting emotions, or the like (Iberall and McCulloch 1969). Ergodically (essential agreement in space and time among all these human activities), that action spectrum is available all around the world: name the action, it is happening someplace at any designated time. Over the day scale, those actions are occurring sometimes at any designated place. The day's musical composition appears (and can be perceived) through the signature of its action modes (Iberall and McCulloch 1969; Iberall and Cardon 1969). The activities of the band or settled community are largely designed around this scale.

Of course, one day is like another, and the minirhythms of the life process appear more fully in program. At the months scale, anxiety and euphoria alternate, not only in the individual but also entrained within the group and the polity as spontaneous or directed moods and campaigns. The year's seasonal vicissitudes call forth the much richer program of all interacting species. At that scale, all of nature and the nations and political states of man are caught up and considerably driven by the fluctuating processes within earth systems (meteorology, hydrology, tectonics, and ecological interactions). In concert, man's actions appear through the minirhythms of trade and war. The fluctuating flow streams of materials, energies, actions, and birth and death of cohorts take place, and certain quotas or wars begin, continue, and end (Wilkinson 1980; Iberall 1973b). "Progress" and accomplishment (e.g., of social change) are perceived and plans modified; leaders accumulate credit and discredit.

At the generational and multigenerational scales, the large-scale patterns of dynasty and trade, of dominant powers and general wars appear (Wilkinson 1983, 1984a). Now we have to know our players--nations, states, rulers, empires, elites, groups, or ruling classes--and what it is that they specifically did and responded to. Even at that, in a physical sense, we view the process as a so-called "one-particle distribution function" picture. We ask how the individual acts or reacts to the mean field of all other individuals.[9]

So man's story, in a hurly-burly, random-walk sense, is constructed from these individual complex human atomisms interacting and fluctuating as the result of external and environmental forces, including the "external" (to the social system) forces generated by the on-board chemical (genetic) potential that all living organisms carry. Those forces interact with internal complex action-memory machinery, and so noisy history emerges. But such a hydrodynamic flow field also has large-scale patterns. Patterns of change emerge at the lifetime scale, and the "long" time scale of near 500 years. Historical memories are extinguished and myths born and modified; civilizations collide and slowly fuse (Wilkinson 1984); universal empires rise and vanish (Wilkinson 1983, 1986). Beyond, at this point beyond the scope of this chapter, lie the further scalings for biological history-evolution. Thus we start from physics, lay out the path of individual biology, and finally return to social biology. Our social history and theory is sandwiched in between.

This provides a taste of how physical science can help organize an understanding of the dynamic foundations for complex systems, such as human social systems. We believe that it is truly novel as an achievement although, as an undertaking, it is well precedented indeed, as we shall argue next.

Positivism, Marxism, and Social Physics

The claims of a social physics that can produce a temporal spectroscopy, such as outlined, or a credible morphology for social-historical processes, can only be evaluated by social scientists who are aware of how the history of social science has engendered its main paradigms.

There is an intertwined history of social physics with social science; it is, on the whole, a melancholy one. We would argue that there are reasons for the unsatisfactory performance of "social physics past." They represent no barrier to "social physics present," nor to "social physics yet to come," provided we ground our work on the foundations of contemporary physics (Iberall 1985; Iberall, Soodak, and Arensberg 1980), rather than pre-nineteenth-century physics, as did the nineteenth-century aspirants to a social physics whose work inspired the main contemporary social-scientific paradigms--positivism and Marxism.[10]

The story of the beginning of social physics is a story, in the main, of the Enlightenment.[11] A thorough inventory of the intellectual figures and notions involved in that transformation from sixteenth-century, moral-religious to eighteenth-and-nineteenth century, scientific-objective thought is given by Becker and Barnes (1961) and Artz (1980), and the philosophic transformation is exquisitely traced in *Great Ages of Western Philosophy* (1957); but they do not present, we believe, a sufficiently rich view of the degree to which that intellectual transformation was driven by the pre-Enlightenment progress in physical discovery. By examining them in combination with Thiel (1957), who provides a more technical history of those discoveries, one can more readily perceive the parallel and entwining development of physical and social themes. But it is Randall (1940) who best connects the two. Randall shows very clearly how the Enlightenment took up and generalized the Newtonian world-machine outlook, and justifies the remark of a reviewer of the Fourth International Congress on the Enlightenment that ". . . the Enlightenment is all a series of footnotes to that odd Diogenes-like figure of seventeenth-century Cambridge, Isaac Newton" (Wills 1975).

Saint-Simon

The seriousness with which the Enlightenment took on the application of the Newtonian world-machine to the perplexing problems of man, mind, and society is clearly illustrated in the writing of Henri de Saint-Simon (1964). Saint-Simon began his "Introduction to the Scientific Studies of the 19th Century" (1808) by asserting that "the advance of the physical sciences and the superiority they have over the theological sciences have been due to the theory of vortices." Translate vortex theory as the mechanics and thermodynamics of fluid-like fields and suddenly the idea is contemporary, and even germane. Saint-Simon held that the intention of the Newtonian revolution was to "base all reasoning on facts which have been observed and analyzed." Noting that physics and chemistry have been so reorganized, he expected that "physiology, of which the science of man is a part, will be brought under the same method as the other physical sciences." Physiology has indeed begun its assimilation to the method of the physical sciences, and we see no reason why anthropology will not succeed in its ambition, expressed at various times, to establish roots in physiology. The ambition and the incompleteness of the Enlightenment both are visible in Saint-Simon's conclusion (1813) that it would be "possible to organize a general theory of the sciences, physical as well as moral [social], based on the idea of gravitation regarded as the law on which God has founded the universe."

It is not possible to organize a general theory of the sciences around the idea of gravitation alone. If one could (as one now can) amend or stretch the Newtonian construct to include the twentieth-century point of view of physical forces taken in electromagnetism, relativity, quantum mechanics, and field theory, Saint-Simon's apparently weird proposal would become serious. But in its time, the Newtonian world-model without these addenda and, most particularly, without statistical physics (statistical mechanics and thermodynamics), was inadequate for its intended purpose--to deal generally and encompassingly with all of nature and life, including mind and human society. (Iberall 1985; Iberall, Soodak, and Arensberg 1980).

Comte

Saint-Simon's sometime secretary, collaborator, follower, and rival, Auguste Comte, nevertheless posited a very broad and general social physics, which he however transmuted into sociology (1830-1842) when the astronomer-mathematician Quetelet also employed "social physics" to denote what Comte felt was a more restricted statistical-empirical view of social phenomena.

Comte's notions were devoid of physical science content, beyond the suggestion that social studies must have a static and a dynamic component. His central contribution is commonly viewed as his suggestion that there is a "hierarchy of the sciences" (a progression of ideas, not just a parallelism) from physical science to biological science on to social science. Comte also usefully proposed the mathematical continuity of history, "the axiom of Leibniz--the present is big with the future, . . . the object of science is to discover the laws which govern this continuity." But Comte's "great philosophic law of the succession of three states--the primitive theological state, the transient metaphysical, and the final positive state--through which the human mind has to pass, in every kind of speculation" is not physical law nor even physical science, but utopian prophesy or tendentious historicism. Thus the pursuit of a hard social science based on physical law was over almost as soon as it had begun. The philosophic highpoint of Comte's thought, and its scientific poverty as physics, that is as a social physics, is already visible in his fourth early essay (Comte 1911). As that 1825 writing reveals, Comte simply lacked both the training and understanding to foresee any of the physical ideas that developed in the second half of the nineteenth century, and which he would have had to have mastered in order to succeed at the task he set himself. As he himself stated clearly: "The purpose of [our] work is not to give an account of the Natural Sciences . . . our object . . . is to go through a course of not Positive Science, but Positive Philosophy."

To probe more deeply into Comte's scientific thought, say into his *Positive Philosophy*, only leads to Ward's discovery (Ward 1883, 1:129) that "[Comte] seems to possess that rare power everywhere manifest throughout his works of weaving upon a warp of truth, a woof of error. The iron consistency of his general logic is in strange contrast to the flimsy fallacies that fill out its framework. . . . He is a great general in the army of thinkers, but, when he . . . meddles with the brigades, regiments, and platoons, he throws them into confusion by the . . . amazing stupidity of his commands."

Nevertheless, one has the sense that Lichtheim had it at least partly right (Lichtheim 1965) when he commented: "The conservative character of Comte's sociology [Comte's *Positive Philosophy* is somewhat better described as "wildly utopian" than as "conservative"!] and the triviality of his conceptual apparatus need not hinder the recognition that his positivism is in the general line of advance first sketched by the French Enlightenment . . . he is in the tradition of Turgot and d'Alembert who almost a century earlier had anticipated his quest for 'invariable' laws of nature and society."

Spencer and Ward

Despite all the differences in their systems, what is true of Comte from the viewpoint of social physics is also true of his rival Herbert Spencer, who likewise attempted to order the sciences. ("On the Genesis of Science," 1854; "The Classification of the Sciences," 1864). Lester Ward, one of the American fathers of sociology, noted the similarity of Comte and Spencer in his *Dynamic Sociology* (Ward 1883), and again in "The Filiation of the Sciences," a paper Ward read before the Philosophical Society of Washington in 1896, which compared Comte's and Spencer's systems and identified them as similar (M. White 1969). Spencer's and Ward's views are discussed in Ward's *Pure Sociology* (1925).

Ward's own works (1883, 1925, 1974) serve as evidence that sociological positivism as a soft social physics was still alive and thriving in the United States at the beginning of the twentieth century. But they also serve as evidence that positivism had by then become congealed as a philosophic posture, and not as a scientific enterprise. One finds in Ward a reasonable desire to create a theory of the laws of society, as positive as those of the body of physical law, side by side with views that amount to little more than a rechurning of Comte and Spencer with a sprinkling of Ward's special biological expertise.

Felix Markham's foreword to Saint-Simon's essays (Harper and Row, 1964) well displays the fundamental contribution that Saint-Simon made to the "positivist" outlook of the social sciences, as the precursor and mentor to Auguste Comte. The contributions of Comte and Spencer are already well recognized historically, better recognized historically than those of Saint-Simon (overlooking Marx); but each was of great importance to the quartet of the newly independent sciences of economics (starting with the notions developed by Quesnay, Adam Smith, and Malthus), anthropology (e.g., the notions developed by Tyler), politics (with its ancient origins in Aristotle, Mencius, and Polybius), and sociology.

Yet all three of these giants (Saint-Simon, Comte, and Spencer) have passed into obscurity--their works are mentioned more often in an antiquarian way than in serious critical dialogs, such as one still holds with the works of Aristotle and Smith. This is not totally unjust. By reading the works of these key promoters of social physics one is struck by the common thread of weakness in the physical background that they brought to their several attempts to develop a social science. Saint-Simon certainly tried--as we learn from Markham--when he "conceived the project 'of opening a new path for the human mind, that of the physico-political' [in 1798], he moved . . . near the Ecole Polytechnique, and studied physics for three years." But the physics of the time was inadequate to the task. Comte's fourth early essay, written in 1825, shows today's reader that its author lacked the training and perhaps the understanding to anticipate the statistical physics that developed in the second half of the nineteenth century. (Quetelet, by contrast, *was* an astronomer and *practiced* astronomy, as well as sociology. His input-output table analysis was much more in line with the physical and engineering sciences that have emerged. Comte might better have embraced than scorned Quetelet's statistics.)

The lineage of sociological positivism can be traced further from Saint-Simon, Comte, and Spencer, through Weber and Durkheim, to modern Parsonianism. Without disparaging the substantive achievements of this lineage, we would characterize it as a dead end in the quest for a social physics, since it evolved from a sociology based on an inadequate physics to a sociology based on no physics at all. Positivism has become a philosophic notion that there coexist a number of loosely ordered, weakly interacting, fundamentally empirical autonomous sciences, a philosophic talking point much like Popper's celebrated falsification criterion for the sciences, rather than any significant "positive" contribution to any of the sciences, e.g., to a generally applicable physics.

Henry Adams

The historian Henry Adams and Lester Ward were both founding members of the Cosmos Club (founded in 1902), a meeting place in Washington for scientists and other intellectuals of note and professional accomplishment. Some key intellectual themes that were emerging at that time were an experimentally viable theory of evolution and a statistical physics applicable even to the atomistic elements of nature. Adams apparently hoped to incorporate within a theory of history that emergent physical theory of natural phenomena. Although Adams did not know Willard Gibbs, it is clear that the ideas of statistical physics and thermodynamics (with which Gibbs was identified) influenced Adams to the point of persuading him that historians ought to try to account for the trajectories of human history by some such physical theory. It was the ideas developed in this new era of physical scientific thought (typified by Maxwell and Clausius, as well as Gibbs, by statistical mechanics and thermodynamics, and by a kinetic theory of atomistic motion) that focussed Adams's concern on the laws of motion of human history, a concern which, unresolved, turned to near-desperation in the last few essays in *The Education of Henry Adams* (1904).

As Henry Cabot Lodge, writing in 1919 to a posthumous preface for the *Education*, commented: "Any schoolboy could see that man as a force must be measured by motion from a fixed point. . . . Study had led Adams to think he might use the century 1150-1250. . . . From that point [as the thrust behind *Mont-Saint-Michel and Chartres: A Study of Thirteenth-Century Unity*] he proposed to fix a position for himself. . . . The 'Education' proved to be more difficult. . . . Probably he was, in fact, trying only to work into it his favorite theory of history, which now fills the last three or four chapters. . . . At all events, he was still pondering the problem in 1910, when he tried to deal with it another way which might be more intelligible to students [of history]. Thus he wrote 'A Letter to American Teachers of History'. . . ." In that 1911 letter, Adams appealed for historians to meet with and work with physicists on the basis of a thermodynamics of historical processes, implying thereby that the former must assimilate physics but also that they could not do so alone. Adams's appeal, one of the most quixotic outcries in the history of scientific and other intellectual thought, produced no direct issue. With its failure was lost a major opportunity to examine a first physically oriented theory of history, and, conceivably, to produce a first physics of history.

Marx and Engels

There is an unspoken or barely mentioned theme running through the positivist writings, provoked by the nineteenth-century unruliness of revolution, counterrevolution, and by the activities of Marx and Engels in particular. They too have a special relation to social physics with still another path to a dead end in the quest for a social physics. That path has been taken by the orthodox, Marxist, "dialectical materialist" tradition, which leads ultimately not to the sociology without a physics of positivism, or to the history without a physics represented by Adams' failed appeal, but to a social engineering without a physics.

That result is not what Marx and Engels intended. They were enemies of the enemies of the Enlightenment as much in science as in politics. They meant to be universalists in both spheres and, as such, they fell out of step as much with their intellectual as with their political milieu. The sciences, and especially the social sciences, fragmented following the Enlightenment's failures, trailing its successes in the American and French Revolutions. When the several sciences assumed their current disciplinary outlines, they concurrently shed all illusions of a universal Enlightenment science. One may conveniently date the earliest end of the Enlightenment's illusions by the guillotine; Napoleon's coronation would also serve, in that Bonaparte the revolutionary autocrat had offered the European intellectual the notion of a universal brotherhood of man to extend (and supersede) the particularism of Charlemagne's dream of a Holy Roman Empire. The crowning of Napoleon as a merely national emperor symbolized for many the victory of parochial political ideologies and the end of political universalism. The end of scientific universalism and the rise of disciplinary particularism might today seem unrelated to the rise of particularistic political nationalism; in view of the intimate relationship of Enlightenment philosophic thought, physical and social science, and engineering, we would argue the contrary.

Certainly among the great nineteenth-century dissenters against the mechanistic Newtonian enlightenment, Marx is notable precisely in that he *also* rejected *both* disciplinary and ethnic parochialism. Marx and Engels proposed a new science, different from the "vulgar mechanics" of Newton, and yet universally applicable to account for "motion and change" in natural systems (the traditional task assigned physics by Aristotle), and fully competent to deal with nature, mind, and society (Engels, writing in 1878 and 1882).

Despite their intentions, and because of their assumptions and influence, Marx and Engels are in their ways as significant key figures in the nineteenth- and twentieth-century failure to produce a physically based social science as are their positivist rivals--established in the West, heretics in the East--in anthropology, sociology, and economics. In their impact on social practice, of course, and in the number of social scientist equivalents they have influenced, they have far outdistanced all those rivals. Nevertheless, Bottomore and Nisbet are right to treat them as equal aspirants when they declare (1978) that "for more than a century there has been a close, uneasy continuous relationship between Marxism and sociology. The closeness is due to the fact that Marx's theory was intended, like sociology, to be a general science of society. . . ." (Also see Harris 1968.) In our view these rivals, alike in their admirable aspiration, are also alike in their lamentable failure. But the style and source of failure are somewhat different.

Scientific Marxism, for rudimentary purposes, can be divided into a theory of historical materialism, the theory that the economic thread is primary in human social evolution, and dialectical materialism, a general theory of action in all systems--natural, living, and social. It is the latter theory that we wish to discuss for its analogous character to physics. Such Marxian theory, we would claim, can only barely be discerned in "the young Marx" (Marx's doctoral thesis); in maturity it is best outlined in Engels's works (Engels 1939, 1935, 1940).

Because this sequence is one of a progressive emergence of scientific aspiration, and as we are concerned not with the failure to try science but with the try that failed, we are less interested than many of our contemporaries in "the young Marx," more in "the mature Marx," "Marx-Engels," and more literally in Engels writing alone ("the dead Marx"?) as the philosopher-theoretician expounding the foundations behind Marxism. (Those who find this usage constraining may, although at their peril, ignore Marx's maturation, evolution, collaboration, and bequest, and read "Engels" when we speak of "Marx"--provided they will also relabel the main twentieth-century offspring of the pair as "Engelism" and "Engelism-Leninism"; otherwise they must accept our usage as apt.)

Marx and Engels, Lyell, Darwin, Freud, even Comte and Spencer despite themselves, are the great dissenters from the populace's image of the Newtonian paradigm. Together these historical-evolutionist dissenters turned the fashion in their sciences away from simplistic "mechanistic" models. But the scientific aspirations of Marx and Engels were more sweeping than those of the other historicists and evolutionists, for Marx and Engels essentially proposed to reconstitute the foundations of physics itself.

The traditional task assigned physics by Aristotle was to account for "motion and change" in all systems. Marx and Engels proposed to abolish the "vulgar mechanics" of Newton as too "static," too "rooted in a metaphysical outlook," and in so doing to establish new laws for motion and change in all systems, whether in nature, mind, or society (Engels 1935, 1939). To replace the "vulgar" mechanics offered by Newton in his three laws of mechanistic motion and his identification of the law of gravitational force, Engels offered the three laws of dialectical materialism: interchangeable transformation of quantity into quality; identity of opposites (including denial of the law of the excluded middle); and the negation of the negation. All that Newton did for physics was anticipated and done better by Kepler, Engels claimed, and dynamics did not begin until Kant's views of the dynamics of nebular condensations. The logic of science is dialectic.

The key to Engels's belief system seems to lie in the following comments (Engels 1939, 26-27; also 1935): "When we consider and reflect upon nature at large, or the history of mankind, or our own intellectual activity [note this repeated election of systems: nature, society, mind], at first we see the picture of an endless entanglement of relations and reactions, permutations and combinations, in which nothing remains what, where, and as it was, but everything moves, changes, comes into being and passes away. . . . This primitive, naive, but intrinsically correct conception of the world is that of ancient Greek philosophy, and was first clearly formulated by Heraclitus; everything is and is not, or everything is fluid, is constantly changing, constantly coming into being and passing away."[12]

We shall not provide a detailed critique of those ideas at this point, only the following counterstatement. Dialectical materialism cannot be viewed as a foundation for any kind of physics whatsoever, and consequently not for social physics. The basic Marx-Engels conceptual physical image appears to be fluid mechanical, and its maximum claim might be that it provides a *metaphysical* resolution, perhaps idiosyncratic, of the antinomy of being and becoming in fluid processes. To make the contrast very explicit, there is a *physical*, scientific resolution of the flow-process problem, and one that requires no more than the physics of the 1820-to-1850 period, which permits deriving the Navier-Stokes equations of fluid mechanics precisely from the "vulgar" Enlightenment mechanics of Newton. The late twentieth-century physics of field-patterned unruliness, even of "chaos," has been largely identified within that very Newtonian description of flow-field phenomena, and via the kind of *spectroscopy* we provide in the first part of this chapter. Dialectics? No, physics!

If dialectical materialism could have displaced any part of physics, it ought immediately to have driven and guided the study of fluid mechanics--the most obvious potential physical application of dialectics. The modern study of fluid mechanics can very properly be said to have been begun with Reynolds's studies of turbulence in the 1880s, precisely in Engels's heyday, just in time to be guided by dialectical materialism, had such guidance seemed fruitful. This did not occur. Surely one would then expect, at minimum, that dialectical materialism would guide fluid mechanics in the Soviet Union, the first and foremost institution ever committed to use dialectical materialist metaphysics (Wetter 1963). We leave it to the reader to determine whether Engels or Newton and statistical physics and Navier-Stokes have shaped the development of Soviet fluid mechanics.

Social Physics After Ward, Engels, and Adams

The positivists, from Saint-Simon to Ward (e.g., in successive editions of Ward's work, as one might find them, say, up to 1902); the writings of Engels (to his death in 1895); and the writings of Adams (until his 1911 letter) show strikingly that these social (and biological) "scientists" felt perfectly competent to broker the science of physics and its applications. They really seemed to believe the ordering of complexity and hierarchy to be the simple motions of heavenly and physical bodies, the increased complexity of the biological organism, and the greatest complexity in society. One has to surmise that the notion that physics was "simple," elementary, and accessible did not falter until Einstein; then, perhaps, the physical dilettante grasped the notion that he or she was outclassed (one might infer a similar thought from the separation of the Proceedings of the Royal Society into Points A & B). At any rate, the claims and concerns died away, the effort was abandoned, and social scientists increasingly viewed physics as an "other" rather than as a "root" discipline.

Have the thus uprooted and disconnected social sciences flourished as equals parallel to physics? Such a view would be difficult to sustain. "Pure" economics has found its center in the equilibrium modeling of Marshall and the mathematical economists; "pure" sociology in Parsonianism; "pure" anthropology in Boas; "pure" political theory in Weber; "pure" history perhaps in Collingwood, Dilthey, or in Barzun. After a long eclipse in the West, fragments of Marxism, more or less "materialist," but hardly "dialectical materialist" (except for some current silliness in background theory for biological evolution), have returned to content with these pure, discrete disciplines, but still without attaining the florescence and momentum of growth that continue to characterize the "hard" sciences seeking their roots in physics.

On the whole, neither "pure" nor "materialist" social science is highly successful in categorizing facts (the precursor to a genuine scientific enterprise); it is yet--to the physical scientist--impressionistic and subjective as a science. It is clear to all that there is a required concern with a science or sciences of man, his behavior, and organization. But it is effectively impossible for a new student approaching the key works of these disciplines to discover a central core of scientific "laws" that underlie the empirical facts about society. The student is indeed schooled in various traditions, but not in principles. This is what has motivated us to write the first part of this chapter (and Iberall 1985, as a very brief statement of principles).

We are not prepared to give up the quest for a genuine social science; we consider that past failures may be attributed to the fact that until recently (Iberall, Soodak, and Arensberg 1980; Iberall 1985) there has been no genuinely physical basis, i.e., adequately physically grounded in an applicable physics, for a general theory of social physics. Many fragmentary applications of physical notions to social science are certainly to be found: e.g., the work of Stewart (1948, 1950), Zipf (1949), Warntz (1959), Richardson (1960), Prigogine (Prigogine, Allen, and Herman 1977; Schieve and Allen 1982), Haken (1975), Montroll (Montroll and Badger 1964). But these applications are precisely fragments; and the contributions of mathematical economists and sociologists, of cyberneticists, and of systems scientists are physically incomplete. Therefore we would claim that, before the two references cited above, there has been no attempt at a general theory for social physics. But the necessary physical basis for social physics does now exist. It is an extension of the Navier-Stokes-like description that has produced cascade-like spectra for geophysics, meteorology, stellar, galactic, cosmological physics, plasmas and biophysical flow fields; and we have herein begun its application to human society via an introductory spectroscopy.

Notes

1. To provide a social context, the history of that apparently exotic subject "social physics" is sketched in an extended section of this chapter. The social science reader who intends to take the spectroscopy outlined here seriously needs a sense of the Enlightenment themes that preoccupied social scientists involved in earlier failed efforts at creating a social physics, or physique morale in their language, and how those earlier efforts were transmuted into sociology and political economy, producing the two main conflicting contemporary lines of social scientific thought, positivism and Marxism.

2. That we are dealing with an operational system means that the equation set is confined to a space-time region in which particular boundary conditions are maintained; that we are dealing with an ongoing system means that the field equation solutions describe phenomena that persist indefinitely in time.

3. Social physics does not insist on the indistinguishability of all atomisms. Human organisms are made of molecules, which comprise atoms and nuclear constituents; but there may be and there are many types of organisms, organs, molecules, and atoms. Thus a lithium nucleus in the brain acts very unlike a sodium nucleus. This illustration reflects the discovery of a chemical diversity in the hierarchical character at all levels. Yet atomistic diversity in no way precludes the physics that accounts for such diversity by showing how atomistic fragments bind, compose themselves, and coexist.

4. In our physiological studies, e.g., those referred to in Iberall (1969) and the kind described in Iberall (1960), we measured the bivariate correlation xy between various fluctuational frequencies of metabolic processes and found such correlation to be negligible.

5. As well as simply identifying the action state descriptively, we must note that, physically, action is the product of energy and time, the "cost" of performing these actions in complex systems (Iberall 1960). All such actions are dissipative--it costs energy to perform these actions. (There is even an energy cost in the eating that provides the metabolic fueling, the "negentropy" to supply all of these actions, including the cost of eating.)

Modes, both in a musical and a physical sense, are the orchestral arrangement and style of playing, not the specific melodies.

Our use of should, can, prudent, and wise is not accidental nor extraneous. Social science and social engineering are as logically intimate and precisely related, although distinct, as science and engineering in general.

6. See note 5 above.

7. Postulating the appearance of a fourth conservation, albeit as a renormalized process with considerable fluctuations, is not to be regarded as a light indulgence that physical theory permits itself whenever perplexed. One has to note that taking on board a chemical potential capable of directing reproduction of living species was a chemically transformative process that began at least 3.5 billion years ago, representing a period almost as long as, at least comparable to, the period for which we reckon the conservation of angular momentum for our solar system.

8. One surmises that as of that time (past a Mesolithic transition, via horticulture and agriculture, to a Neolithic way of life with settlement and subsequent urbanization), man attempted to invent a new, a fifth, conservation of value-in-trade or exchange, out of mind. Why consider it a conservation? Because at the moment of an exchange, both parties in the exchange consider value to be symmetrically exchanged. (A thief holds a gun to your head and demands, "Your money or your life." You consider and make the exchange. Value given and received!) Value-in-trade is a renormalized conservation within the social field that reveals the capability of the chemical solvent character of that field to evolve; its post-Neolithic character represents a desire to deal in long range convective trade with stranger, as well as neighbor with neighbor. It clearly does not have the absolute character of the physical conservations. Thus its application is often breached (e.g., discounted) or not imposed, as in the family, among friends, or when conducted as exchanges that may or may not be sanctioned by law or custom: tribute, bribery, robbery, discount. Yet settled urban society operates with the fiction that money is a proper conservation measure for trade in all the other conservations: of materials, of energy, of action (e.g., as labor), of people (e.g., as in marriage exchanges, or slavery).

9. As individuals, we are not only conscious of the actions of other individuals with whom we interact, but we are also aware of the "pressure" of the whole society. Clearly, such social pressure begins to make itself strongly evident to the human atomism at the daily scale. That awareness and its consequences at all scales beyond the daily is what represents the social pressure and what we mean by an individual reacting with the mean field of all other individuals.

10. Those readers who do not feel sufficiently familiar with the themes and controversies of the social sciences may wish to peruse some or all of the following books, which have been selected to provide richness of ideas with economy of number: Harris (1968), Bottomore and Nisbet (1978), Heilbroner (1972), Schumpeter (1954), Skinner (1978), Pfeiffer (1978), Sabloff and Lamberg-Karlovsky (1975). A vigorous and brilliant demurrer to conventional (or classic) economic thought has recently been written by Jacobs (1984). The subject matter and art of the historian can be glimpsed very richly in Barraclough (1978) and Braudel (1981-1984). Two books that provide a flavor of the biological background for the social sciences have been written by Young (1971) and Elliott (1969).

11. Physics, currently, is attempting to develop a grand unified theory

of physical forces capable of reaching that early energetically dense period in history in which all of the forces in nature acted with the same strength. It is interesting, in the study of the origins of the Enlightenment's scientific themes, that one is confronted by a similar question as to how and when philosophy and science separated from theology. The significance of this question was not clear in Iberall 1973c, which could only make a start toward the Enlightenment by beginning with Jean Bodin in 1550. It now seems more appropriate to consider the "grand unified theory" age as beginning to end with Thomas Aquinas in the mid-thirteenth century. (Authentic unified theories of any merit may well require polymaths, like Aristotle and Aquinas. They were not unique.) It is difficult not to be impressed by the scope of the Bishop Oresme who, having made very significant contributions to philosophy, mathematics, and physics, is also now considered to be the greatest medieval economist, known, for example, for his late-fourteenth-century studies on the early invention of money, its purpose and function, and the effects of its debasement as it applied to the monetary system of fourteenth-century France. Or, what is one to make of the contribution of Copernicus--essentially the originator of the physical revolution in modern thought--who wrote a monetary treatise based on nine years of study, early in the sixteenth century (1519-1528), at the request of the Polish King Sigismund? The problem he addressed was similar to Oresme's, the significance of debasement of currency and the disorganization of the monetary system in the Prussian provinces of Poland.

One also notes that the Copernican astronomical system came about in response to a theological problem, the Lateran Council's request (1514) to provide a basis for a new calendar; indeed it was the pope who gave publication approval to Copernicus's findings (1536). Physical science took off as a completely independent discipline at the end of the seventeenth century; political economics also became a significant study in the seventeenth century, and part of the eighteenth-century Enlightenment package, seeking independent scientific status in the nineteenth century.

Nevertheless, to this day, the threads of theology, philosophy, and science have continued their common, imperfectly congruent writhings. An interdisciplinary study like this one must underscore the continuing and uneasy entwining of the intellectual threads engendered by these three now distinct outlooks. For the future, society would be well advised to underwrite polymathic training and research, just as it now underwrites specialization.

12. Whether Engels's philosophic construct has a great deal to do with Marx's theory of the evolutionary form and stages of social development, and the political-economic interpretation of the state, we shall not here explore. Lichtheim (1965) offers a carefully reasoned study of Marxism's connection to Engels's theoretic; see also Wetter 1963).

3

Shumpei Kumon

The Theory of Long Cycles Examined

Since the latter half of the 1960s, we have been observing symptoms of destabilization in the international order known as *Pax Americana.* The failure of the intervention in Vietnam not only triggered social turmoil in the United States, including campus unrest and an explosion of racial problems, but also brought about such problems as decline in productivity and in the growth rate of GNP, a rise in the rates of unemployment and inflation, a drain on gold and dollar reserves, and a decline in the value of the dollar. The increased weight of the Soviet Union and China in military and political affairs and the rise of Japan and the European community in the economic realm created the impression that a multipolarization of the international system, perhaps in the form of a "five-power" structure was under way. On the other hand, despite the hopes aroused for "a decade of development," the progress of the countries in the South appeared stalemated, tending toward the widening of the gap separating them from the advanced countries.

With these experiences in the background, we also saw some new trends emerging in U.S. social science in the 1970s. For Chirot (1981), who reviewed the change in economic development theory in that decade, that process was one of a shift away from "modernization theory" toward "world-system theory." Modernization theorists thought

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that modernization (or economic development) could be achieved as a result of the internal efforts of each nation and that in that process the capitalistic economic and social system of the United States would serve as the model of such development. To the contrary, dependency theorists or world-system theorists of the 1970s argue that the capitalism and imperialism of the United States were the very cause of poverty in the peripheral regions. Thus the United States changed from being a model of development to being the root of all evil.[1] In other words, a shift occurred from an internal type of explanation of development toward a theory of "externally induced" poverty.

A noteworthy change occurred in the field of international political economy. We can adduce as examples what William Thompson calls the "transition model" (1983a,b) and what Daniel Pearson (1983), among others, calls the "hegemonic stability theory."[2] The "transition model," as presented in Organski (1968) and Organski and Kugler (1980), classifies the components of the international system in terms of the dominant great power, great powers, and medium and small powers, and also in terms of those that are satisfied with the status quo and those that are dissatisfied with it (the dominant great power is considered to be the most satisfied with the status quo).[3] It argues that the probability of war occurring depends on the power relationship between the newly emerged (group of) great powers that are dissatisfied with the existing arrangements, the dominant power that is status-quo-oriented, and the group of great powers that are satisfied with the existing arrangements. The "hegemonic stability theory" argues that the international system, especially its international economic order (free trade, investment regime), can be maintained as long as power is concentrated in the hegemonic state. But if a deconcentration of power occurs within the system because of the loss of dynamism on the part of that state, technological transfer to other countries, and the overcommitment of the hegemonic power to its past policy and principles, a self-sufficient and closed economic zone will emerge and the free economic order will be dismantled.[4]

It goes without saying that the emergence of these theories has been facilitated by the decline of the role of the United States as the "dominant power" or the "hegemonic leader." In addition, these theories mainly focus on the contemporary industrial society as their object. On the other hand, the proponents of "world-system theory," as represented by Immanuel Wallerstein, deal with the entire history of the capitalist world economic system, which is considered to have been established in the sixteenth century. And they attempt to discover not only mere trends but also the regular recurrence of some kind of long cycle.[5]

The long-cycle theory of modern world systems of George Modelski and others, which I will discuss in this paper, is one of the theories that represent a new trend in American social science of the 1970s (particularly since the latter half of the decade). It is similar to "world-system theory" in that it deals with, as its object, the whole of the evolutionary process of the modern world system since the end of the fifteenth century,[6] but it exhibits much more clearly the characteristics of a cyclical theory. It is similar to the "transition model" and the "hegemonic stability theory" in that it makes more of the political aspects than of the economic ones and that it asserts a close relationship between politics and the economy; but, it does have the distinct characteristic of considering more explicitly the three subsystems of politics, economy, and culture as the components of the world system.

Modelski's theory has already been introduced to Japan to some extent by Watanabe (1981), the Study Group of Democracy (1982), the International System Study Group (1982), and Tanaka (1983). There is also a paper contributed by Modelski to *Voice* (1983b). But these reviews deal only with the comparatively early works. Yet Modelski and the scholars and students belonging to his group continue to publish papers today, and further progress in both theory and testing is recognizable. The author happened to have an opportunity to stay at the University of Washington where Modelski engages in teaching and research and was able to obtain almost all the results of this group's recent work. Moreover, I had several opportunities to discuss these matters with Modelski himself. In what follows I will introduce the outlines of Modelski's theory--with emphasis upon the new developments--without touching upon its testing aspects, and will add my own view of the implications of this theory for Japan's role in international society.

An Outline of the Long Cycle Theory of the Modern World System

The discussion of Modelski's theory in our country has so far relied chiefly on Modelski (1978) and (1980a). Modelski, however, has since published other such works (1980b, 1981, 1982b, 1983a, 1983b) and in these noteworthy developments or changes of his thesis may be recognized. First of all, I shall briefly describe the outlines of Modelski's long-cycle theory based on these new works. Where necessary, I will also refer to the arguments of other scholars, such as W.R. Thompson, who belongs to the Modelski group.

The object of Modelski's theory is the maritime-centered "modern world system" that emerged at the end of the fifteenth century as a result of Portugal's (and Spain's) *political* decisions and actions, reached its maturity in our time, and may experience significant structural change in the near future. This modern world system is composed structurally of several world regions that have different cultures, and functionally of the following subsystems: (1) the global political system, (2) the global economic system, and (3) the cultural system.[7] The first two are comparatively highly integrated and occupy salient positions in the entire system; but the level of integration of the cultural system is low and its saliency is low too. Although these three subsystems have close relationships with one another, there exist boundaries distinct enough to allow us to distinguish each of them as subsystems. In Modelski's theory, the core of the modern world system is the global political system that moves according to its own dynamics.[8]

The global political system (the system of collective actions aiming at the production of public goods, such as order and justice--we may call them political goods--in the common interest, not through the market mechanism but through the mechanisms of mutual benefits and redistribution) is not a centralized imperial system; but, it is not a completely decentralized balance-of-power system (in Kaplan's 1957 terms, a null political system) either.[9] There exists in it a nation-state called the world power that exercises particularly strong world leadership and it supplies and maintains, mainly at its own expenses, the public good of international order in a manner compatible with its own organizing principles (that center around maritime security and trade).[10] The other countries (and groups and individuals) act as the consumers of this good.

The international order revolving around the world power will decline after a certain period and be replaced by a new international order with a new world power at its center (although, exceptionally, a "repeat performance" of the previous world power can happen). It is the "global war" that decides the issue of "who will organize the world and how" after the old order collapses, and that works as the mechanism peculiar to the global political system of selecting a new world power. The emergence of a new world power, as a consequence of the global war and the construction (and collapse) of the new international order (or the new world leadership structure), is repeated through the processes of the long cycle, with one cycle taking about 100 to 120 years.[11] The existence of such "long cycles of world leadership" is first an empirical fact and, theoretically, it is thought that it may probably be explained by (1) an entropic decline that is inherent in every order, (2) the erosion of monopoly power, and (3) the existence of "cobweb-type" time lag that can be found between the supply and demand of order.[12]

One cycle consists of four phases (each of which is twenty-five to thirty years long) called (1) global war, (2) world power, (3) delegitimation, and (4) deconcentration. The idea of dividing one cycle into four phases and identifying the beginning of the cycle with the global war seems to have been established relatively recently.[13]

The final phase of each cycle marks the emergence of a challenger (or a group of challengers) that aims at the position of the world power. However, so far, no challenger has won a global war. The new world power is usually an ally of the previous world power (except for the case of repeat performance). The periodization of each phase of each cycle and a list of global powers and major challengers are shown in Table 1.1.

The past world powers share some common characteristics. So do the challengers. The commonalities shared by the world powers are:

1. Geographical conditions (island or peninsular location)
2. Domestic politics stable and open to the outside
3. A lead economy

4. A politicostrategic organization (in particular, a powerful navy) that can exert its power on a global scale.

The commonalities of the challengers are:

1. Continental location
2. Significant domestic divisions, political and social
3. Abundant economic capacity that is, however, uncompetitive in relation to the world power
4. Lack of consistency in constructing a politicostrategic organization, and also a lack of knowledge and conceptual equipment for managing a system of global proportions (Modelski 1983b)

The modern world system exhibits two characteristic features: (1) the recurrence of long cycles; and (2) the occurrence of irreversible evolution. With regard to the global political system, the latter includes, for example,

1. The refinement of diplomatic methods
2. The evolution of military strategy in terms of both organization and weaponry
3. The formation and spread of the nation-state at the state level (Modelski 1981, 1982a)

It is the evolutionary process of the global political system that creates the core of the modern world system, but that process is, at the same time, closely connected with the evolution of the global economy. Both are, so to speak, "doubly linked." That is, the area where the world power prevails is also the area where the most active world economic activities unfold, and political world leadership and economic world leadership have been, in effect, two sides of the same coin. Although, on the one hand, economic development is made possible only within a firm and stable political framework, on the other, a strong resource base is also needed to maintain the political role of the world leader. In addition, sustained economic development also has the effect of conferring the legitimacy of world leadership on a rich, progressive world power that forwards such developments.

The long cycle of the global political system (the Modelski cycle) has a close relationship with the long waves of the economic system (Kondratieff cycles). Modelski identifies the major cause of the former with the global war on the one hand, and thinks, on the other, that the Kondratieffs occur as a function of the relative abundance (or scarcity) of the resource base that can be directed toward economic activities. If we think that the former consists of four phases, each having about thirty years of duration, and has a total cycle of about 120 years, and that the latter consists of two phases (the phase of rising prices = scarcity of resources and the phase of falling prices = abundance of resources), each lasting for about thirty years, and has a cycle of about sixty years, the possibility arises that both are congruent with each other. Modelski's hypotheses about the relationship between the two include:

1. That the political system and the economic system are basically different systems and are each relatively autonomous
2. That, however, they are related to each other in that they attempt to utilize limited resources competitively
3. That the salient periods of the political system and the economic system alternate; one tackles, during its salient period, the problems the other leaves unsolved during its own saliency
4. That during the salient period of the political system, resources are mainly directed for use in the political system, which increases the scarcity of resources in the economic system; as a result, prices go up (or vice versa)
5. That what adjusts the relationship between the two is the value system in a broad sense--prices are one of the proxy variables of the system. (Modelski 1981)[14]

As compared with such saliency of the political system and the economic system and the strength of their mutual relationships, it is believed that culture does not have much significance in organizing the modern world system (in contrast with the medieval Christian world). Culture is regarded as no more than the *internal* organizational, unifying factor of nation-states that are the strong components of the modern world system. In other words, value relativity has been another characteristic of the modern world system.

A modern world system in which cultural integration remains weak and political and economic competition among independent nation-states is fierce necessarily produces unstable and cyclical movements. Needless to say, the global war is a big cause that makes the system unstable, but the waves of various innovations that surface in the political and the economic sectors also disturb the system. Furthermore, not only does the decentralized culture system of value relativity have no power to control them, but this decentralization of value itself also functions as a destabilizing factor (Modelski 1982a).

Therefore, if we intend to construct a stable system, there is no other way than to aim at changing the structure of the modern world system itself. That is, it is necessary to lower the saliency of the political and economic aspects of the world system and, at the same time, to aim at the revitalization of world culture (Modelski 1980b).

If such a change occurs, it will mean the end of the "modern" world system--or the transition to a new world system. But that is the ultimate political goal of the world system and it is needless to say that more short-term and middle-range goals and challenges also exist. For example,

1. The search for a "plural" leadership (exercised by several states) in place of world leadership exercised by a single world power
2. The search for other (less costly) formulae in place of global war as the mechanism for selecting the world power[15]
3. If we suppose a continuation of the "singular world power" leadership formula, the search for the possibility of an American "repeat performance," which appears to be the relatively more desirable, in the sense of creating less turmoil
4. If it is inevitable that the global political system should move from the phase of "delegitimation" to one of "deconcentration," the search for the possibility of a smooth transition lest it should take place so rapidly as to compound the chaos--in other words, the effort might be to prolong the process of decline as long as possible even if the definitive recovery of the United States' predominance is difficult to attain (Modelski 1980a, 1983b)

These are the latest outlines of the framework of the long-cycle theory of the modern world system, as seen through Modelski's and others' recent works. It should be understood that, as compared with the situation prior to 1980, the evolution of the theory can be recognized in various ways. Noteworthy among others, is the fact that the argument does not take up the dynamics of the global political system as the only problem, but expands to deal with the relationship between the political system and the economic system and, further, with their relationship to the cultural system, and that it is developing toward a theory of the entire "modern world system."

Modelski and others, in addition, have attempted to develop the long-cycle theory also in relation to dependency theory, and to the theory of political party (Modelski 1983c, 1983a); they have analyzed the territorial commitments that can be both the cause and the effect of the decline of the world power (the territorial trap), and have carried out an analysis of the ability of the world power to create and to manage the public debt during the periods of its rise and predominance (Thompson and Zuk 1982; Rasler and Thompson 1983). Also, attention is paid to the place of long cycle theory in relation to other theories of international relations and other social sciences (Modelski 1983a).

Thus Modelski's modern world system theory, which is being systematized through development into different areas, appears to be an extremely suggestive and appropriate theory, especially for thinking about the twenty-first century world system and Japan's position and role in it. At the same time, theoretically, there are some points that are somewhat unsatisfactory; in what follows I should like to make some comments that are limited to those issues.

The Implications of Modelski's Theory

I shall now discuss what kind of inferences become possible, or what kind of uncertainties remain, for the future of the world system, and particularly for Japan's position and role in it, if we accept the general outlines of Modelski's long-cycle theory.

First of all, in what phase are we supposed to be at this point in the cyclical and evolutionary process of the modern world system? In his early works, Modelski (1978, 1980a) divided one long cycle, which lasts about 100 years, basically into three phases--the global war, the period of world power's predominance, and the period of the world power's decline--and argued that each lasted about a generation.[16] Based on this, he defined the present as the beginning of the period of decline of the United States as the world power, and argued that we would now see the multipolarization or bipolarization of world politics and the revival of nationalism but that, on the other hand, a global war would not occur for some time to come (at least about thirty years) (Modelski 1980a). This led to a perspective that views the present situation of international politics as comparable to the 1870s, not the 1910s or 1930s.

In the more recent work, however, he also places the present at the beginning of the third phase of a four-phase long cycle, the phase of delegitimation of the leadership of the world power. But in this case, after the third phase has lasted almost through this century, the fourth phase (deconcentration) must pass by before the next "global war" occurs--if it does. Speaking of comparisons with the preceding cycle, the 1970s have thus become comparable to the 1840s or 1850s, rather than the 1870s.[17] In economic respects, this view tends to present the last one-third of the twentieth century as the rising period of the Kondratieff (price) cycle, or the stagnant period of technological innovation. To what extent this new periodization is appropriate is a question closely related to the problem of how to assess the degree of the effects of the information (mechatronics) revolution, the emergence of advanced communications systems, etc., upon the whole of economic activity, and it requires further careful consideration. It also has to do with the assessment of the possibility and the limits of the United States' efforts in the "delegitimation" phase to recover its predominance as the world power. Probably, it is incorrect to think that the decay process of *Pax Americana* will proceed rapidly in the sense that it has as yet only just begun. On the other hand, it would be premature to conclude that the present recovery of the United States' relative predominance has the possibility of leading directly to the restoration of its absolute predominance (that is, that the confusion of international order in the 1970s was nothing but a passing episode). It may be safely assumed that even if the "repeat performance" of the United States as the world power is possible, it is not a matter to be realized within such a short period as ten or twenty years. At least, as long as we base ourselves on the present form of Modelski's theory, it seems that we cannot avoid this conclusion.[18]

Second, who is the main challenger (country) to the world power, the United States, in the fifth (twentieth-century) cycle of the modern world system? It seems that Modelski has cautiously avoided specifying the challenger, or has done so simply because it is so obvious. In fact, in Modelski (1983b), which was written for Japanese readers, the Soviet Union is explicitly named as the challenger.

If, however, we examine carefully the implications of the new periodization, it is possible to think that the main challenger in the fifth cycle has actually not yet been determined. To use an example from the past, Great Britain challenged the then world power, the Netherlands, three times during the third (1635-1661) and the fourth (1662-1687) phases of the third cycle (the seventeenth century). France, which was to be the main challenger later, even declared war in alliance with the Netherlands against Great Britain in the second Dutch-British War. If the major form of international conflict in the fifth cycle is trade friction or economic war, the view that it is Japan challenging the United States as the world power in the third phase of this cycle (and that, if Japan's challenge shows increasing success and both the United States and the Soviet Union begin to feel a serious threat from it, the United States may come to ally with the Soviet Union to counter Japan) cannot be dismissed outright. On the other hand, it may be imagined that if the Soviet challenge vis-à-vis the United States does materialize in the end, it will not be until after a full-blown U.S.-Japanese alliance has been formed following fierce U.S.-Japanese economic friction and, as a result, Japan's submission (and probably following a Soviet-European alliance that will be formed in response to it). There even exists a prediction (Poniatowski 1980) that the international relations of the twenty-first century will revolve around the central axis of the rival relationship between a European-Soviet alliance and a Chinese-Japanese alliance, as the result of an alliance with Japan by China that will have become a superpower by way of two decades of growth (and as the result of America's continued linear decline).[19] In any case, the change of the situation from the 1980s to the 1990s will determine what the basic axis of world politics is likely to be during the "deconcentration" phase that is predicted to occur at the onset of the next century (or even that axis can change further during the global war phase), and there is no reason to regard as final the present structure of East-West confrontation that exists as an extension of the past Cold War.[20]

Third, related closely to the discussion above, what are the "politico-strategic organizations, that are capable of 'global reach' [that is, of exerting power or influence globally]" or that are the sources of such power today, in the twentieth century? Modelski has often emphasized that in past cycles these have centered around naval power. But can it be said that the situation has not changed even in the latter half of the twentieth century? Thompson (1981) deals squarely with this question, but his answer is that the importance of the sea is still great today and that the concept of the "battleship" of the past is sufficient today if its meaning is expanded to include the following three: (1) aircraft carriers, (2) nuclear submarines, (3) the SLBM system. But in contrast to this, Cole (1983) takes notice of the importance of the role of outer space and of man-made satellites (75 per cent of which are said to be for military purposes), and examines various kinds such as (1) reconnaissance satellites (e.g., the Big Bird and KH-11), (2) electronic information satellites (e.g., the Ferrets), (3) early warning, nuclear explosion detection satellites, (4) marine-watch satellites, (5) reconnaissance satellites, (6) navigation satellites, (7) weather satellites, and (8) geodetic satellites and manned spaceships (space shuttles or space stations) and various counter satellite systems, emphasizing the fierceness of the U.S.-Soviet arms race in this field and directing attention to the significance of satellites as means of deterring nuclear war.

Incidentally, as Cole recognizes and as Modelski (1980b) suggests, if nuclear deterrence works effectively, the possibility (or requirement) emerges that the way in which the global war functions as the selection mechanism for the next world power itself will change. For the present, the significance of war with conventional weapons is likely to become higher but, apart from that, an attempt to resolve problems by, for instance, economic warfare or economic-cultural competition is also conceivable. In fact, in the modern world system, war as the means of competition for power among sovereign states was evolving toward higher sophistication because its magnitude, scope, and duration appeared to become more limited as time passed; but, it reversed its characteristics almost dramatically during the two global wars (i.e., the Napoleonic wars and the world wars of the twentieth century) that triggered the transformation to the fourth and fifth cycles. It may be said that it is also because of such a loss of limits upon the scope and magnitude of war that a nuclear conflict has become a war that is virtually impossible to fight. If such an escalation of war reaches its ultimate limit, then another formula in place of the use of military power (i.e., the use of power in another form) may begin to be groped for.

But even if, for example, such a formula takes the form of "economic warfare," the possibility seems undeniable that it, as the functional substitute of "global war," will take on a character considerably different from ordinary business competition. It can be argued that such a transformation of war corresponded with the era when the main current of social-competitive games changed from a "power game" among states to a "wealth game" among enterprises--that is, with the coming of the industrial era. But today, a new type of competitive game, which ought to be called the knowledge game, is beginning to emerge in place of the rise of industry or of capitalism (I will discuss this in more detail in the following section). In other words, it is coming to be commonly believed that the twenty-first century will be an era of "informatization" rather than industrialization. But there is a good possibility that the challenger country in such an era may be one step behind in respect to informatization, as in the case of France vis-à-vis Great Britain in respect to industrialization. Probably, there is no denying the possibility that such a challenger, while avoiding the use of military power, may resort to unlimited economic warfare (such as massive export campaigns), and the world power that stands up to meet the challenge may also try to match it by unrestrained measures (including, for example, import bans, the freezing or confiscation of property, the introduction of extensive protection or subsidy measures). If this is so, the probability that the characteristics of economic warfare which, with the progress of industrialization and the coming of an affluent society, were evolving in a direction of greater refinement, can reverse themselves by the onset of informatization deserves careful examination. We may hope that an examination from such a point of view will give us important suggestions as to the new forms of "power" emerging at the transition of the long cycle into the twenty first century (or, depending on conditions, the transformation of the modern world system itself).

Fourth, there is the problem of the universalistic ideology of the world power. According to Schmidt's (1982) interesting argument, all the past world powers promoted, in their rising periods, certain universalistic ideologies that justified their own world leadership, and that, by coalescing with political and economic interests, manifested their own great power. Moreover, the meaning of such ideologies went beyond mere convenience and hypocrisy, and exerted influence upon the peoples of other countries and regions. On the other hand, in the phase of the delegitimation of the world power, we observe forces that attempt to delegitimate the world power not just in its political role but also in its ideology, both from without and from within. At the same time, a new ideology that is claimed to have a higher universality emerges in place of the old one (succeeding to part of the old ideology in some respects). According to Schmidt, the Christianity of the Order of Christ in sixteenth-century Portugal (an ideology opposed to Islam), the Calvinism of the seventeenth-century Netherlands, the enlightened religious tolerance and the emphasis placed upon secular institutions (states in particular) in eighteenth-century Great Britain, the Methodist and Evangelical churches' ideology opposed to slavery and hard labor in nineteenth-century Great Britain, and the ideology of democracy and the protection of human rights (anticolonialism, antidictatorship) in the twentieth-century United States all represent the universal ideologies of the successive world powers.[21]

Incidentally, is there a possibility that Japan might create a universal ideology and disseminate it globally? The *hakko ichiu* (the world under one roof) theory of pre-World War II vintage can probably be said to be one such attempt, but it failed miserably. In today's Japan, both the "Japan-as-a-special-country theory" and the theory of "Japan as more Euro-American than Euro-America" are much heard of, but a universalistic ideology that claims that Japan's own values and institutions can have universal validity and that they should be spread to the world, seems to be very weak. It exists only to the extent that there is an argument for the possibility of the universalization of a "Japanese style" of business management. But we do not know whether, in the future, the "Japanese ideology" that advocates the universal applicability of a Japanese style of business management or economic management formula based on "Japanese religion" (*schichihei yamamoto*) may not become more powerful. In any case, if Japan is to share even a part of the role of world leadership, it seems that she cannot help developing a certain universalistic ideology.

The fifth (and perhaps the most important) problem that is related to the above is the question of who the next successor to the world power is going to be or what the future of the modern world system might be.

Modelski (1983d) examines two sets of conditions he calls the "demand-side of the system," in addition to the specific qualifications listed earlier for every world power. One of them is systemic inertia--the force that tries to make a new world leader as similar as possible to the past one and that makes for continuity, such as: (1) the same country repeats its performance as the world power; (2) even if another country becomes the world power, it will be the country that has similar characteristics such as commonality of origin (e.g., the fact that the United States was a former colony of Great Britain), continuity of space (e.g., the fact that the geographical location of the world power has shifted gradually to the west), or close connections at the elite level (e.g., the fact that both are Protestant); and (3) that the next world power enhances its chances of leading the world by forming a special relationship with the present world power to share its world leadership for a certain period (e.g., the special position the United States enjoyed in its relationship with Great Britain). The other condition is the new qualifications with which the world power must be endowed in order to cope with the new problems that arise in the world, and he cites: (1) a more substantial resource base (such as population and economic capacity) to deal with global problems, (2) an innovative capacity that can meet the demands of the changing era (e.g., to propose a functional equivalent to the global war), (3) an ability to carry out a structural reform of the system to better fit the solution of new problems (e.g., to arrange for an alliance of several countries, not a single world power, to take charge of world leadership), and so on.

But as Modelski himself is ready to acknowledge, these two sets of conditions have mutually exclusive characteristics, which makes the prediction as to the structure and the subject of world leadership in the twenty-first century more difficult. In fact, with regard to the change in the world system, from now into the twenty-first century, as long as we base our premises upon the present form of the theory of long cycles, we may probably not eliminate any one of the following possibilities (arguments 3-5 assume that a functional equivalent of the global war will be found):

1. The case in which the challenger (of firm determination and prepared to fight through a thermonuclear war) wins (for the first time)
2. The case of mutual destruction through a thermonuclear war and the ensuing "discontinuation" of the world system
3. The case in which the original world power (i.e., the United States) resumes world leadership
4. The case in which a country that develops a special relationship with the United States will succeed in occupying the seat of the next world power
5. The case in which a new world leadership organization is formed that is based on joint leadership by a number of countries or that is based on rule by a centralized world federation or a world state

In order to limit the scope of theoretical possibilities further, it is necessary to make the contents of the theory more specific. In what follows, I should like to attempt to deepen the specificity of Modelski's theory not in respect to the repetitive aspects of long cycles that the modern world system displays, but with regard to its irreversible evolutionary tendency.

The Three Stages in the Development of the Modern World System

Independent of Modelski, I, too, once thought that the development of modern industrial society meant the structural change of the system occurred approximately every 100 years (Kumon 1978b). What directly led me to that line of thought was my becoming aware that the "great transformation" of capitalist society that Karl Polanyi (1975) anticipated had not taken place in the twentieth century. That is, I preferred to think that industrial society or capitalist society, so long as it is viewed as a world system, produced structural change or evolution of some limited time scale, maintaining the basic arrangements of capitalism as the premise, rather than to assume that it has brought about some essential change in the twentieth century. I called the change of modern society from the nineteenth century to the twentieth century a transformation from the "nineteenth-century system" to the "twentieth-century system" and, by extension, attempted to predict the "twenty-first-century system." I refer to my work (1978b) for the details of this argument, but even while holding this view, I felt impatient not to be able to say much about the specific contents of that "twenty-first-century system."

On the other hand, I presented as a hypothesis (1978a) that, depending on the kind of rewards that serve as the goals of participation, it is possible to distinguish three types of competitive games (that is, social games) in which social actors participate as players and that can also be made the decentralized management formula of the social system: the "power game" that aims at the attainment of "power" (that is, "human" goods as a generalized good); the "wealth game" that aims at the attainment of "wealth" (that is, material goods as a generalized good); and the "knowledge game" that attempts to gain "knowledge" (that is, information goods as a generalized good.[22] Proceeding from the definition of the term "industrialization" as "the development and diffusion of the low-cost mass production formula for individual material goods," I stipulated there that "modern Western society is the market-industrial society where wealth-attainment competition is widespread." In other words, I likened the "organization-imperial society," where a power game is widely played, and the "information-oriented society," where a knowledge game is common, to, respectively, the premodern society and the postmodern, postindustrial society.

Of course, I knew that in the field of international relations, the origin of modern international society had been commonly identified with the conclusion of the Treaty of Westphalia, in 1648; and that, apart from that view, others see the origins of the modern "system of states" in the earlier period (Wight 1977), and also that some like Wallerstein (1974) take the position that the formation of the "modern world system" had already begun around 1450. But it was when I encountered Modelski's works that I was made acutely aware, for the first time, that it was necessary to reconsider the position that tries to understand the "modern period" exclusively in relation to "industrialization," the position I myself adopted in Eto (1982, ch. 6). And, as I repeatedly read some of Modelski's works and wondered, I came to realize that it may be argued that the just mentioned three types of social games, with some revisions added to their definitions, in fact correspond to three stages in the development of the modern world system itself. Let me now discuss this briefly below.

First, let us define "modernization" as "the formation of groups of highly independent, self-regulating actors (subjects) playing social games." The social games in this case are those that particular actors play with the purpose of getting as the rewards of the game the means (or "media") to satisfy their own individual needs, and, at the same time, they have the characteristic of fulfilling the needs of the social system as a whole. For such games to exist, the following need to be established:

1. Technology (e.g., manufacturing industry) to produce individual media (e.g., industrial products) at low cost and on a large scale
2. "General media" or "generalized goods" that are more than merely individual means for satisfying individual needs, and that become (like wealth) the payoffs of the game
3. Rules and organizations for transforming individual media into general media
4. Concepts and organization for the self-accumulation and self-maintenance of the general media (e.g., what Marx calls "capital" as the embodiment of wealth, or Polanyi's self-regulating market)

The above examples are taken on the assumption that in the period of industrialization (after the end of the eighteenth century) which was the second state of modernization, the "wealth game" was extensively played with firms as its dominant players. But what can we say if we apply the same perspective to the first stage of modernization (sixteenth to eighteenth centuries)?

In respect of the creation of the "social actor" (for playing the social game), the characteristics of the first stage may be regarded as consisting in the formation of what we call "sovereign states." It is not impossible to regard a sovereign state as a field for people in which to carry out power games. But if the main object of our interest is the modern world system, with sovereign states as its components and the social game that is being played in it, the nature of the game being played inside the sovereign state itself becomes nothing but a secondary problem. Rather, if we pay attention to the fact that individual sovereign states compete with each other for the immediate purpose of securing individual means such as territories or colonies, special products of remote lands such as pepper, precious metals, and slaves, trade routes and trade rights, or trade balances, then it seems more appropriate to ask whether such activities may not be some kind of "social game."

Let us recall the four conditions mentioned earlier for the existence of a social game. With regard to the development of the low-cost, mass-production technology for individual goods, we may, following Modelski, mention the revolutionary development of the techniques and instruments of ocean navigation and naval battles (the navigation revolution) that occurred between the fifteenth and the sixteenth centuries. The so-called commercial revolution was one of its results. As for the generalized goods (general media) that transcend the boundary of individual media, we may think of the status each state occupies in the modern world system--especially the status of the "world power" or the status of a "global power" (that lies a step short of the former). As Modelski says, the mechanism that ultimately decides the status of the world power was "the global war," but we may say that the status or the ranking of global powers is affirmed and confirmed within the "diplomatic circle" of sovereign states. Thus, it may be possible to say that, based on the amount of individual "goods" each sovereign state attained, the rules and organization for transforming the individual "goods" into the generalized good (or "power") were created in the form of international practice of diplomacy and war. Finally, regarding the concept of self-accumulation (or self-maintenance) of "power" and the formation of an organization for that purpose, it is not as clear as in the case of the "wealth game," but we may argue that the appearance of the concept of "balance of power" has a significance that is comparable to it.[23]

For the game endowed with such mechanisms--let us hereafter call it the "power game"--to be regarded as one form of *social* game, it must be possible to argue that the needs of the system as a whole will also be satisfied if this game is played. But this point may not be so important a problem. It may be sufficient to say that accompanying the formation of modern sovereign states, the modern world system experiences a rapid development such as no past social system had ever seen. In addition to that, as Modelski also points out, we may mention the argument that because the "world power" pursues its own individual interests directly, it attempts to create and maintain international order that is a "public good" for the world, and that such attempts have contributed to the development of the entire system. All in all, the "formation of nation-states," viewed as the first stage of modernization, may be regarded as the time when one type of social game--the power game--came to be widely played.[24]

It may be said that, as compared with the "wealth game," this "power game" is undifferentiated and undeveloped as a social game. "Power" as the generalized good can be said to have been a more inclusive and less differentiated concept that can include the later "wealth" and "knowledge"; whereas territory, human beings, precious metals, and other goods may be regarded as lower in the degree of specification when compared with the goods produced in a specific manner or with the knowledge obtained in a certain specific way. At the same time, the "states," as the players of the game can be thought of, are actors quite similar, in various senses, to the later "industrial firms." The functions of the nineteenth-century style "night watchman state" and that of the twentieth-century style "welfare state" are those that came to be given to the state, as the result of its transformation due to the emergence of the wealth game. In its formative period, the function of the state lay in the pursuit of power itself. It may be said that to combine the forces of its members, to achieve internal unity, and to redistribute among its members part of the power acquired guaranteed the existence of the state itself, rather than primarily providing for the security and welfare of the people (just as the activities of industrial firms aimed at the well-being and welfare of the employees have a secondary meaning for the pursuit of profits, the essential purpose of those firms.)

With the formation of "industrial firms" (which is the second stage of modernization), this "power game" was gradually replaced by the wealth game, with firms acting as the dominant players of the new social game. Its beginning was the development of the technology and methods to produce individual material goods in large quantities and at low cost--that is, industrialization. As the usefulness of industry came to be widely recognized as the formula for securing individual goods (and ultimately the general wealth), not only firms but also states (especially new sovereign states) began to view participation in the development of industry and the wealth game as their own affair. The Soviet type of "socialism" aimed at "industrialization in the one country" was the typical model. But, more fundamentally, it seems that the state stopped playing a part in the social game and changed its function rather in the direction of playing the role of an umpire or of the enforcer of the rules of the game.

In fact, in the twentieth century, when the wealth game has spread widely, nation-states that earlier were of relatively small size and internally well unified are now moving in the direction of having quite large populations, incorporating various ethnicities and adopting the governmental structures of a multilayered federal state (at least as far as the "superpowers" are concerned). At the same time, the tendency has risen to deny the legitimacy of war. After World War One in 1928, a treaty to outlaw war was signed by fifteen countries and, after World War Two, even a state like Japan emerged with a constitution that included the renunciation-of-war clause. On the other hand, there has emerged the tendency toward the multinationalization and denationalization of firms. These developments may be said to suggest that the "power game" as a social game has declined and is losing its legitimacy.

Furthermore, today, close to the end of the twentieth century, the legitimacy of the wealth game is also being challenged. It is fresh in our memory that international public opinion was aroused in support of the regulation of the profit-seeking activities of multinational corporations, and that the zero-growth theory triggered by the population explosion and the environmental-pollution-resources problems, also attracted the attention of many people. Furthermore, the convulsions of international society revolving around the two oil crises in the 1970s made the phenomenon of unequal development of industrial society more and more pronounced. That is, on the one hand, there is the emergence of newly industrialized countries (NICs) that have achieved rapid economic development, undaunted by the rise of oil prices, and the case of Japan that, despite a decline in its economic growth rate, has succeeded in adapting to the new situation through energy conservation and the transformation of its industrial structure. On the other hand, there are some countries that are suffering from "advanced-country disease" where the economic slump has also caused sociopolitical instability, as well as other countries where industrialization has failed to take off and still others that find it difficult even to aspire to it now. Facing these situations directly, some attempts at adjustment in the ideological dimension can also be observed. For example, when Euro-American values (such as individualism), which were originally regarded as conducive to industrialization, are found to be lacking in viability, the tendency appears to be to deny the value of industrialization, while upholding those Euro-American values as more important. The idea is also emerging that since the so-called non-Euro-American values, which are claimed to be more suitable for industrialization, have actually existed in Euro-America from olden times, it is necessary to reassess them. Furthermore, some argue for the need to create new values in order to construct a society that transcends industrialism.

Is it not possible to think of a perspective that would grasp these new situations systematically in relation to the past and more effectively predict the future? It may be useful to view the present as the period when the third stage of modernization is about to begin, or the period when the third social game that will replace the power game and the wealth game is being developed. That is, I suggest that, instead of viewing the knowledge game as a postmodern social game, we should try to think of it as one to be played within the larger framework of the modern period, yet as something different from the "wealth game" that corresponds to industrial society.[25]

The first necessary condition for the knowledge game to become a social game is "informatization," that is, the development and diffusion of the technology and methods needed to obtain knowledge and information as mass produced, low cost individual goods.[26] But there are some other necessary conditions. As I have stated (1978a), what becomes both the result and the cause of the development of "informatization" is the growth of the idea that individual knowledge can be transformed into a generalized good, which might be called "truth" as compared, for example, to "wealth" in the past, and the formation of specific fields and rules for its transformation (comparable to the market and the transaction rules therein in the case of the wealth game). Furthermore, it will be necessary to create actors that try to participate positively in this new game. Perhaps, as compared with industrial firms as the players in today's wealth game, the players in the knowledge game will be smaller and more decentralized actors (and it can be imagined that giant corporations, or regional autonomous bodies, viewed as loose coalitions of those groups that control large-scale communication networks and other facilities, will play a role similar to that which the state adopted in relation to corporations in industrial society). In this sense, the third stage of industrialization may be understood as the "formation of small-scale groups and their networking" that follows the "formation of states" and "formation of industrial firms," but the generic name for this new actor, comparable to those of the "state" and the "corporation," does not seem to have been determined yet, although I myself am tempted to suggest the "team."

Formation of the modern state replaced divine authority with human sovereignty. Then industrialization replaced human muscle energy with machine energy. The sources of power that were symbolized by the oarsmen of a galley, by soldiers, or slaves changed through the Industrial Revolution into the sources of wealth that were symbolized by machines (and the labor power accompanying them). Likewise, informatization will replace human intellectual ability (the ability to create, transform, communicate, and store information) with artificial intelligence. Just as the replacement of human mobility by machines did not necessarily cause the degeneration of the former, but facilitated the development of spontaneous activities called "sports," artificial intelligence may be expected not to bring about the degeneration of human intellectual ability, but to facilitate the development of spontaneous intellectual activities, which might be called "scholee." By the accumulation of such spontaneous activities, is not human society going ultimately to move away from the modern period into the postmodern age?

Such a perspective has many implications; I should like to list only some of them.

First of all, if we add the above perspective to the framework of a long-cycle theory of Modelski's kind, we seem to be able to say the following with regard to the transition period to the sixth cycle of the twenty-first century in the modern world system:

First, world leadership of the next era will be carried out mainly by the country or the region that will have promptly succeeded in the knowledge/information revolution.

A second implication does not mean that war or economic conflict will suddenly disappear. Particularly during the delegitimation period, the third phase of the long cycle, the probability that "intermediate war" will be fought several times is by no means negligible.

As the global wars that initiated the fourth and fifth cycles became still larger in scale and magnitude than the earlier global wars, there is a possibility that the conflict that opens the sixth cycle will be greatly different in character from past conflicts.

Fourth, if "informatization" and the accompanying military technology are further developed, the global war in the military sense will probably become impossible to fight. Is there not a possibility that, in place of that, for instance, the competition centering around the control of communications circuits or data bases, or the monopolistic use of artificial intelligence systems will be carried out in the form of economic warfare that has never taken place before (for instance, in the form of a conflict that combines with it the characteristics of a cultural conflict)?

Fifth, are not these changes in the form and nature of conflict already beginning to extend not only to the future "global war" but also to intermediate war?

Sixth, if that be the case, as a policy to prepare for the transition period, we may need to find out what country is likely to lead the knowledge-information revolution, making sure, with all means at our disposal, that we do not fail to participate in this revolution ourselves; and, just as we make efforts to establish friendly relations with the lead country, we must take the necessary measures to cope with military or economic conflicts that may break out at any time.

It also seems possible to make the following forecasts as to the structure of the world system after the sixth cycle:

1. As far as the political system is concerned, whereas a global government organization far stronger than today's United Nations will come into existence, the role of local autonomous bodies, smaller in scale than today's nation-states will increase and that of the governmental organization at the state level will diminish. If we can expect that the global system of transportation, communications, and trade that extends not only over the surface of the ocean but also into outer space and under the sea, will further and further develop in the future, it seems that it will become difficult for one country to provide and maintain the "public goods" of this kind and to aim at their more or less exclusive use, judging not only from the limitations of its economic capacity but also from the fact that other countries and regions may be expected to make a stronger and stronger demand for their use. Therefore, although it is hard to believe that a centralized power structure of the world government type will be created as early as the twenty first century, the possibility seems to be high that the world political system of what Modelski calls the "joint leadership" type will come about in place of the singular world power leadership type. In any case, the military will be used mainly as a "world police force."

2. As for the economic system, it seems likely that the degree to which profit-seeking independent firms assume

the role of production and distribution will be reduced; it is rather the nonprofit organizations that will mainly take charge of supplying goods and services, including welfare services. In other words, economic activities will come to form a part of social activity that fulfills the function of more routinized distribution of resources rather than form a part of the competitive game.[27]

3. Borrowing Modelski's expression, the cultural system is not so prominent in the modern world system as the political system or the economic system, for it has been a subsystem of a low degree of integration. But, after all, is not the reason why the political and economic systems came to stand out so conspicuously in the success of the power game and the wealth game a result of the "navigation revolution," first as a political revolution that brought about the formation of nation-states, and that took the form of the first stage of modernization and then of the "industrial revolution" as the economic revolution that formed the corporation and occurred as the second stage of modernization? Is the knowledge-information revolution which is going on today, not the cultural revolution that corresponds to the third stage of modernization that will play the role of making the cultural system more salient than the other subsystems? In other words, it may be argued that the knowledge game will spread by enfolding the cultural sub-system within the modern world system.

The above are the points I should like to add to Modelski's type of world-system analysis, in order to place more emphasis on the evolutionary aspects of the systemic theory that is part of the theory of long cycles. At this point in time, these arguments remain within the boundaries of abstract theory and there seems to be much room for debate as to how well they stand up to an empirical, historical analysis. At some other time, I should like to have an opportunity to attempt to link them with such an empirical analysis.

Notes

1. Similarly, some phenomena observed during the 1970s such as Japan's achievement of "modernization through a 'catch-up' strategy" and her adaptation to the oil crises, the emergence of so-called NICs, and the rapid rise and decline of the power of the "South" (OPEC and GROUP of 77) may encourage changes in the social sciences of the 1980s. The study of culture within the framework of the social sciences developed by Ohbayashi et al.

(1982) and the "new modernization theory" presented by JPERC (1983) are some examples. The impact of the "information revolution" underway in the 1980's may be reflected in the social sciences a little later on.

2. Cf. Kokusai Taisei Kenkyukai (1982). This is a detailed survey of the new theoretical developments of the 1970s, including world-system theory, in international political science. It is not my intention to make a similar comparison of theories in the present article.

3. The following explanation is based on Thompson (1982, 1983).

4. The above explanation is based on Pearson (1983). Pearson lists Kindleberger, Keohane and Nye, Gilpin, and Krasner as advocates of the "hegemonic stability theory."

5. The general characteristic of theories in social sciences developed in the 1960s (the golden age of the United States, also known as the age of high economic growth) was the attempt to make forecasts based on trends (rather than cycles) expressed as exponential functions. In this sense, cycle theories (including the Systems Dynamics Model developed by Forrester et al.) can also be called a new feature of the 1970s. As Wallerstein (1979a) points out, the emergence of cycle theories itself is cyclical: the assumption of constant growth becomes popular in "good" times and some cycle theories are advocated in "bad" times. But in either period, it is implicitly expected that the "good" times will continue or return.

6. That is, the exploration of new trade routes via the Cape of Good Hope and America in order to break the monopoly of Venice (cf. Modelski 1980b).

7. According to Modelski's definitions, "polity" is a mechanism for maintaining order, justice, and security; "economy" is comprised of the institutions of production and market exchange systems; and, "culture" is a mechanism for stocking, maintaining, conveying, and enriching standards, values, and knowledge (Modelski 1980b).

8. Modelski's early papers, for example (1978), deal only with the world political system. But as we will show later, the relationship between the world political system and the world economic system is explicitly discussed in Modelski (1981) and Modelski (1982a); Cole (1983) states that another name for the world political system is "nation-state-system" or "system composed of nation states."

9. This is the definition of Modelski and Thompson (1981).

10. Modelski uses the term "world leadership" rather than "hegemony." World leadership means the capability of supplying some principles for world order and of being a model or a focus of other countries' attention (cf. Modelski 1983b). In other words, it is thought inappropriate to use "hegemony" for expressing a world leader's power because world politics under the modern world political system is characterized more by the aspect of cooperation than by that of ruling. The acquisition of colonies is not a natural tendency of a world leader but a byproduct of its decline. Modelski argues that it is also inappropriate to characterize the political aspect of the modern world system with such expressions as "Anarchy in the international society" or self-help by individual countries (cf. Modelski 1983a).

11. Wallerstein (1979a) discusses a longer "logistic cycle" (150-300 years). But Modelski has not taken such a position so far. All we can find is the idea of dividing the entire history of the modern world system into two periods, "mercantilism" between 1500 and 1750 and "industrialism" after that (cf. Modelski 1980b). We discuss the Kondratieff cycle below.

12. Cf. Modelski (1983a) and Modelski and Thompson (1981).

13. In his earlier papers the starting point of a cycle was considered to be the fourth phase mentioned here (Modelski 1978) or the second phase (Modelski 1980). But, of course, the emergence of a future world leader is observed much earlier, in the third phase (cf. Modelski 1983b) of delegitimation.

14. Based on this hypothesis, we can say that the present is the period

in which the United States' leadership is "delegitimated" in the political aspect and, in the economy, resources have become scarce (inflationary). (Then what will happen to the world inflation that seems to be subdued for the moment? Will it come back in the near future? Or has the worst period been just passed?) Thus, the most important task for the present world is to renovate the polity or, in other words, adjust (temporarily) the leadership structure in world politics. The United States' efforts to regain its supremacy and the tendencies toward "new mercantilism" or "nationalism" pursued by individual countries are cases in point. In the past, major efforts to renovate the polity were observed primarily in the rising phase of the Kondratieff cycle (the period when the prices of basic resources were rising) (Modelski 1981, 1982a). Modelski thinks that the balance of power in world politics formed during this period, which is also the phase of delegitimation, is very important in the sense that it is a prototype for the next global war phase or the selection process replacing a world war.

15. A group led by Modelski at the University of Washington has a research plan for conducting a three-year feasibility study on the "Functional (Political) Substitutes for Global War."

16. More precisely, it was assumed that there were two other short phases--a period of "weak organization" prior to a world war and a period in which a new world order is formed after a world war.

17. Cf. Tanaka (1983) for examples of similar comparisons.

18. Of course, this is not a conclusion deduced from the long-cycle theory as a "grand theory." It is only one of the possible explanations obtained in the process of the further development of that "grand theory" by applying it to empirical data.

19. If we go further, there may be a possibility that in the Soviet Union, socioeconomic reforms or revolutions will have taken place on a large scale by that time.

20. Modelski himself rarely refers to a specific country as a challenger in the fifth cycle. When he mentions the Soviet Union in Modelski (1983b), this is an exception. But Cole (1983), whose focus is the twentieth century, regards the Soviet Union as a self-evident challenger.

21. Modelski (1983d) regards the coexistence of two lines in global strategy (i.e. an "army strategy" vs. a "navy strategy") within a leading country as ground for the emergence of a two-party system (or multiple political forces). Schmidt (1982) argues that there may be more than one "universal" ideology within a world leader but that the relationship between ideologies and party lines is not clear.

22. In addition to the "social game" method, a society can be operated also in a decentralized way, via control over individual actors through internalized norms (morals or religion), cf. Kumon (1978a).

23. We can conceive that the "social game" mentioned here ended up without the development of "personification of power" or of a self-stabilizing mechanism for power balancing mainly due to its immaturity as compared with the "wealth game."

24. This "power game" should, in spite of some similarities, be differentiated from what I once called the "struggle for power" in organization.

25. I regard (1978a) the "knowledge game" as a game of the postmodern era. But here, I try to change my old viewpoint so that a broad range of plays of "social game" per se can be regarded as modernization.

26. Here, we are not going any further into problems associated with the definition of knowledge and information. But when we talk about them, they mean not only technology (knowledge of facts) but also the knowledge of values such as ethics, morals, and religions. "Information revolution" includes the development of human brain power (and its employment), as well as the development of "external" devices such as computers and communication equipment.

27. Countering this, we can expect the argument that the role of

nation-states and firms has recently been enhanced (that is, the number of independent countries has risen in the latter half of the twentieth century; LDCs' hopes and efforts to industrialize themselves have become greater). But we have a tentative answer to this argument. Some peoples' or ethnic groups' desires to establish their own independent entities are one thing, but the general direction of the world system is another. It is quite natural that they should want to control governments and diplomacy, and advanced industrial organizations (especially market economy systems) within their own territories. In fact, nation-states and industrial firms are the two great "inventions" of the modern world system. But we do not have to think that the development of democracy and market economy system is the prerequisite for "waging a knowledge-information revolution." Maybe they can be obtained more easily as a result of this revolution.

4

George Modelski & William R. Thompson

Testing Cobweb Models of the Long Cycle

In this chapter we explore one possible conceptualization of long cycles, that which relates world leadership to the supply of, and the demand for, order at the global level. The cobweb cycle, one of the basic items in the tool kit of the economists, seems to offer a convenient avenue for further developing the implications of that conceptualization. We shall test the predictions of two types of cobweb models against an array of data on world political processes extending over five long cycles.[1] Our tests not only document the existence of some striking regularities over this entire period, but also show that one of the models has merit in furthering our understanding of long cycles of world leadership.

The Global Polity

Let us conceive the global political system,[2] or for short, the global polity, as cooperative action, people acting together at the global level for the attainment of common interests or the production of public goods: that is, in Talcott Parsons's sense, for the "collective pursuit of collective goals" (1969, 317-318). The polity, unlike the economy, is not in Polanyi's (1957) terms a system of exchange with reference to prices, but rather a system of social interchange whose generalized medium is power (Parsons, ch. 14).[3] But, like the economy, it is concerned with generating an output of valued products and that is why in the global polity, too, we can distinguish, analytically and empirically too, as basic political categories, between those who produce and supply the political goods of order and justice, and others who consume them. The most important such collective goods in the global system are international peace and security, the enjoyment of territorial rights and political tenure, and the regulation of global economic relations. Throughout this paper we shall use "order" as summary terms for all of these.

We take the principal producers of order in the modern global polity (that is, since 1500) to have been, in their respective cycles, the world powers shown in Table 4.1: Portugal, the Netherlands, Great Britain, United States. As the purveyors of services of world leadership and thus accounting for the bulk of the production of order, they occupied the central political role in the world system because leadership is a requirement of collective action (Mitchell 1967, 110). Others, too, contributed to order (including other global powers [see Table 4.2] and other actors participating in networks of diplomatic, intergovernmental and transnational arrangements), but it is the assumption of this chapter that such contributions have been of lesser significance and tended to be wasted during periods of oligopolistic rivalry and global warfare.[4]

The consumers of order in the modern global polity are, in the first place, states and national governments, and a variety of organized groups and interest aggregations including, in the final analysis, individuals.[5] Political parties, especially those of the world powers, play a particularly crucial role in organizing and focusing the demand for global order.

Table 4.1 An Abbreviated Outline of the Modern Global Political System's Five Long Cycles

Cycle	Approximate Duration	World Power	Formative Global Conflict
I	1518-1608	Portugal	Italian wars (1494-1517)
II	1609-1713	United Provinces of the Netherlands	Spanish wars (1581-1608)
III	1714-1815	Great Britain	French wars (1688-1713)
IV	1816-1945	Great Britain	French wars (1792-1815)
V	1946-	United States of America	German wars (1914-1918, 1939-1945)

Global collective action may be seen to occur in all of the arenas of global politics. These arenas include the great coalitions, the alliance structures, the international organizations, international regimes, and the routine fora of diplomatic bargaining, as well as the electoral and political processes of all global powers. The coordinative activities concern security, protection, and the redress of grievances on the one hand, and support, taxes, and loyalties on the other. They concern, in part, material objects including flows of supplies, assistance, resources of territorial rights and privileges, but also important symbolic matters such as gift exchanges, displays of wealth and power, exhibitions of solidarity, as well as demonstrations of hostility towards common enemies.

The Supply of, and the Demand for, Global Order

If the goods and services of global order are in fact subject to a generalized process of joint action between leaders and nonleaders, that is, broadly between producers and consumers of order, then we should be entitled to employ the concepts of supply and demand in respect to global order and inquire how the supply of such order is brought into a meaningful relationship with the demand for it. Hence we should also be able to apply in this field the rudiments of demand-supply analysis and to clarify some facets of our analysis with the standard diagrams (Mitchell 1967, 114).

We need to assume first that order has a quantitative dimension, that there can be more or less of it. Indeed it should not be too hard to distinguish conditions of disorder or insecurity, or anarchy, from other situations characterized by superior order and a pervasive sense of security and well-being. In the global polity, for instance, we would regard periods of worldwide warfare, and the waves of "international anarchy" anticipating them, as extreme examples of disorder, and periods of general peace as generally exhibiting characteristics of "high order." As we do not assume such conditions to be naturally ordained or reflecting the forces of nature but rather the results of human endeavor, good or bad, successful or failed, we are led to look for sources of such conditions in the interactions of the producers and consumers of such order. We define a condition of disorder or insecurity as one in which the quantity of available order is low.

We also assume that order is subject to qualitative considerations because it is an element in social choice and because it may be preferred, to a greater or lesser degree, over other values. In social choices, the value of the political good of "order" is equal to that of economic or sociocultural projects forgone; for practical purposes, it might be measured by military and governmental expenditures and other indices of mobilization as compared to economic or cultural commitments. In a certain sense, it is the legitimacy of the public order. Viewed as an association of consumers, a polity may attach greater or lesser value to order; that is, it may be prepared to make greater or lesser sacrifices in order to procure it. Some polities value order highly and allot large proportions of their attention and their resources to cultivating it (and thus, in the somewhat ambiguous phase, display a preference for "guns over butter"); others value it less and give higher priority to wealth or to cultural or social values. Politics may alternate between periods of high and low priority given to order.

A supply schedule summarizes the characteristic behavior of the producers of global order, principally the world powers. Supply goes up when the valuation of order in the global system, and especially by the world power, rises. This tends to occur in response to conditions of crisis and insecurity and after the learning experience of the consequences of international anarchy; it will also go up in response to projects responding to global problems (e.g., through discovery, exploration or other forms of innovation). In such conditions, producers can raise taxes and mobilize their friends for collective action. But when the valuation of order declines, the incentives to raising output disappear and exercise of leadership loses its appeal.

A demand schedule reports the typical or the average response of the consumers of global order. The schedule normally is downward sloping, inasmuch as the valuation put upon such order tends to fall as its quantity and accessibility go up. The more peaceful or orderly the world, the less likely is the public to encourage and to sanction burdens for preserving order.

This discussion thus confirms that the relationship between the production and availability of order, and its evaluation, can be represented by a standard-form demand and supply diagram. The two functions may be seen to intersect at a point that can be regarded as one of equilibrium for the global polity. But the precise shape and, in particular, the precise slope of these functions (i.e., their elasticity) remains an open question. We are not aware of the precise value of these elasticities. In general, however, we would expect both these functions to exhibit fairly low elasticity. That is, they would tend to be "steep" with respect to the horizontal axis, showing that a large change in valuation would induce only a small change in the quantity of order.

On the supply side, conditions favor low elasticity because one or a few nation-states are the principal suppliers of order, and so much depends on their political makeup and the capacity and adaptability of their decision-making processes. Since large governments are subject to the forces of bureaucratic inertia and standard operating procedures, the response lags are likely to be large. The dominant conditions tend to be barriers to the entry of new producers; the costs of entry are high and such effort as is exerted by rivals for world leadership is likely to be competitive waste. Only crises of great magnitude (political, social, or religious) are likely to have much impact on the quantity and complexion of order as supplied.

On the demand side, the prevalent condition is one of product differentiation, a preference for what is known well (the status quo). We know that the demand for order is bound up with questions of national integrity and survival, life and death, and even the future of civilization, for all of which there are few, if any, substitutions. For governments, as the rule, territorial inviolability is nonnegotiable. These considerations make it likely that the demand for global order will be relatively inelastic.

Conditions for a Cobweb Cycle

In economics, the fluctuations occurring in markets in which the quantity supplied depends on prices in previous production periods are known as cobweb cycles (Boulding 1941; Lange 1959; Nilson 1967; Samuelson 1973). Characteristic of industries in which relatively large time lapses occur between the decision to produce and the finished product, cobweb cycles are often found in agriculture. In fact, among the first to be studied were "hog cycles." Cattle breeding and fruit tree culture have been other important examples. But the logic of the cobweb cycle extends beyond agriculture when the maturing season (as for livestock or for plants) is a given of nature and may be observed in all conditions where the gap between a productive investment and the act of final consumption is long and, in the given conditions, beyond remedy. Hence it is applicable to investment decisions for large products of economic or social construction and in all large schemes of a public nature (road systems, large power systems, great projects of research or discovery).

The basic analysis of the cobweb is quite simple. If we assume, at one point in time, the available quantity of a product subject to large production gaps, for whatever reason, to be limited, its price is likely to reflect that scarcity and to be unusually high. This scarcity is likely to encourage producers to take steps to enlarge output in the next production period and others to enter the industry for the first time. That decision will (by assumption) take some considerable time to reach fruition, but when it does the market is likely to be flooded by the new output. Then its valuation is likely to suffer a perceptible decline and, over the next production period, we would expect this to have some important consequences. Some output will then be curtailed by allowing facilities to run down and by neglecting innovation, while certain other producers will leave the field altogether. Whenever these decisions take their effect, over some fairly lengthy period of disproduction, the availability of the product will decline and scarcities will prevail once again.

The precise manner in which the path of adjustment proceeds will depend on the elasticities of the demand and the supply functions; but, in all cases, the path will be a circular one in a cobweb pattern around the notional point of equilibrium. Economic analysis distinguishes between constant cobweb cycles (where the slopes of two functions are equal), converging cycles (where the demand function is more elastic than the supply function) and diverging cycles (where the supply function is more elastic than the demand function).

In the original studies of the cobweb cycle, emphasis is placed on the "production gap" as the determinant of the entire process. Thus the length of time it takes a herd of cattle or a fruit orchard to reach maturity is the key to the following revolutions of the cycle. But this production-side emphasis of cobweb cycle analysis could well be supplemented by some attention to marketing and information factors. For example, a glut might be prevented if care is taken to shape demand: by organized (cartel-like) or government-controlled marketing, by the diffusion of information (so that excess capacity or undercapacity are avoided), and generally by greater wisdom and foresight and by the process of learning from the mistakes of the past. Buchanan (1968, 23-24) has pointed out that the demand for public goods frequently tends toward a cyclical pattern of behavior. Demand tends either to excess, when all principal actors rush into heavy production, or toward shortages, when no public actors see sufficient incentive to act, or when the consensus is to "let someone else do it." While public goods assuredly have their own share of production gap problems, these demand-side difficulties are particularly prominent in political conditions where the provision of public goods lacks organization. We know that the global polity indeed suffers from deficiencies of information, weakness of the concept of world public interest, and an overriding condition of incomplete institutionalization. When these are compounded by the size and complexity of the world system, the results are decisions that in retrospect will show lack of wisdom and foresight.

Does the global polity, then, exhibit characteristics that make it likely that a cobweb cycle could help in the description of its behavior? Yes, it does; there are a number of reasons for answering this question in the affirmative.

1. Like agriculture, the global polity, too, is rooted in certain biological constants, especially those given by the human life cycle. Human beings take time to grow and to mature, to receive an education, to go through the time-consuming process of learning. The learning process differs for succeeding generations. Hence political fluctuations based on factors of generational learning and experience, and intergenerational conflict, both in elite groups and among populations at large, should not be surprising.[6]

2. The global polity requires large facilities and organizations for its functioning. Among the facilities and organizations commonly requiring huge investments are the military and, especially, the naval and air forces, each a complex of a number of weapon systems, research and development organizations (e.g., the space effort), coalition and alliance structures, and world organizations. In each case, the production gap between the decision to initiate a project and the time when full results are in and costs are recouped is large. The global polity itself is inherently a very large system; it is the largest human political system known to mankind. Hence its fundamental processes must also be inherently slow and ponderous. Lack of output adjustment over such time spans is hardly surprising either.

3. As for the "information gap," the global polity is a system whose working as one system is least well understood and sometimes still thought to be akin to processes of nature. In such an opaque system, the chain binding cause and effect, if not altogether invisible, has been poorly understood and adjustments, again, unsurprisingly, slow. But the matter goes beyond simple information because the question remains: Why has the learning process that is a common remedy for cobweb cycle fluctuations not been operative in this very important case? The answer seems to be that learning has been obstructed by structural weaknesses in the sociocultural realms. The global system has been short on solidarities and the cultural consensus, which are the underpinnings, and complete the institutionalization of, stable social systems. Their absence creates an environment favoring the ups and downs of the cobweb cycle.

4. Over and above these considerations, the political history of the modern global polity has been characterized by periods of relative peace and order followed by periods of turbulence and disorder. For an example, one need only contrast most of the nineteenth century with the first half of the twentieth century. The central question raised by examining cobweb models is whether these known periods of relative order and disorder are structurally and sequentially linked--and therefore explicable--or whether the global times of troubles are simply randomly distributed. Given our appreciation of the long cycles in world leadership and our asserted linkage between world power and the net supply of order, it seems likely that the availability

of order in the global polity is not randomly distributed.

All these are good reasons for supposing that the global polity may not be immune to conditions that favor the cobweb cycle. These also are conditions for believing that the long cycle of world leadership might be a form of cobweb cycle. But which kind of cobweb cycle?

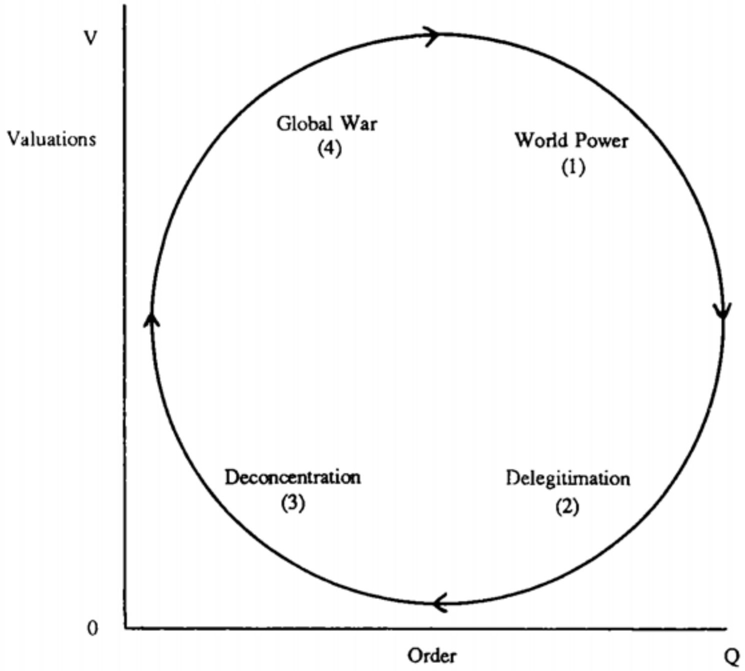
The Single Cobweb

The simplest and, indeed, the most obvious model of the long cycle is a circular one, in which one long cycle is described as a single completed movement along the periphery of a circle. As in Figure 4.1, the path of the global polity over the span of one century may be described as a circle in a space bounded by the coordinates of order (as the output or the effective strength of a structured leadership system), and the valuations (or community preferences) that govern the availability of order, at some radius around a central point.[7] The four quadrants of that circle could be seen, as in Figure 4.1, as so many phases of the long cycle. Global war, for instance, describes the global polity emerging from its lowest level of insecurity (measured on the horizontal Q axis) and gradually reversing that condition as the preference for order (measured along the vertical axis V) rises, to transform eventually into the phase of World Power. The long cycle is thus shown to pass through four phases, but the circular model is really one whose central feature is the instability of order--the entropic decay from order to disarray, as in a spring winding down, or any structure decaying, as it must.

The problem with the circular model is that it is descriptive rather than analytical. It does not explain why the spring winds up again once it has wound down. It does not tell us why the system should keep moving along its circular path for a second round, rather than explode, or maybe move toward an equilibrium position.

Some answers to these questions may be given with the help of a "single-cobweb" model of the constant-cycle variety. As we know, a constant cobweb occurs in conditions of equal slopes of the two functions. When it occurs, the constant cobweb describes a path quite close to that of a circle. If we now assume the production-information gap in the global polity to be about one-half century, then we can take the critical event to be the general peace settle-

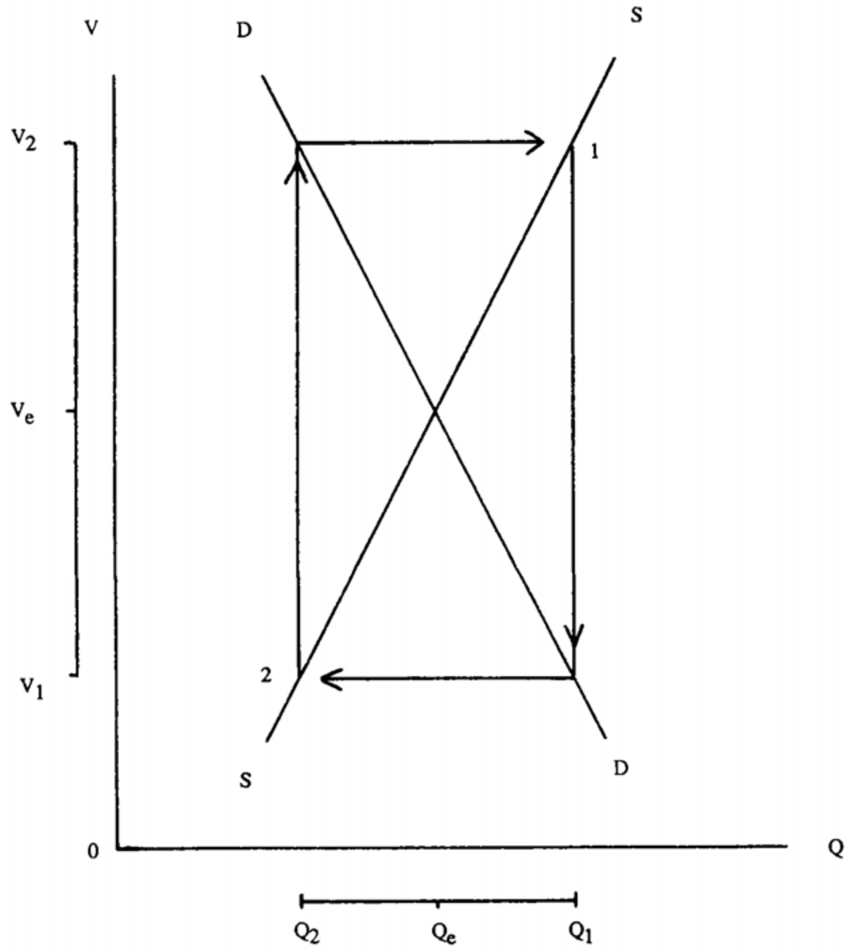
Figure 4.1 The Long Cycle as Circular Movement



ment that concludes a period of global warfare under the leadership of a world power (as in Vienna in 1814-1815). In conditions of high valuation for stability and order this pushes the global polity into a condition of order that lasts for several decades and lends stability, even ultra-stability to international relations and territorial security to member states. But as the order persists, the general preference for security declines and the effort expanded on maintaining the system declines. A half-century later, the level of order reaches a low point: competitors challenge the world power (as, e.g., Bismarck's new European order after 1870) and the fabric of security is now fragile. In the end, any one of a number of crises is capable of setting off a world war; one does, and general warfare ensues. Out of such conflict, and out of the reestablished desire for order, emerges a new world power as the stabilizing anchor of the entire system.

The process evolves as in Figure 4.2, showing a constant cobweb cycle. At point 1 on supply schedule SS, the output of order has newly achieved a level (OQ_1) because, in the

Figure 4.2 The Constant Cobweb Cycle



previous time period, the preference for order had reached the high level of V_2. But over the long run, this amount of order proves to be higher than the consumers are prepared to accept. For, according to demand schedule DD, they give it a valuation or priority equal to OV_1. In due course, therefore, (over the unfolding of the production-information gap) the quantity of order in the system adjusts to this valuation, and the level of order declines to reach its lowest point, 2 on the supply schedule (equal to OQ_2). This, in turn, ultimately proves unsatisfactory, giving rise to a climate of insecurity, unrest, and in the end, to global war. At that point the demand for order rises, to reach the level OV_2. The system then returns to point 1. Nothing would seem to stop the cycle from repeating itself, in a constant pattern, given the persistence of these demand and supply conditions.

There is much to be said for the single cobweb. For one, it possesses powerful simplicity. Second, it concentrates persuasively on the central process: the creation of order, its inevitable erosion, and its ultimate recreation. Third, it recognizes the emergence of the world power and the order that is associated with it (the Iberian world order, the Dutch supremacy, the *Pax Britannica*) as a tremendously massive investment project in collective organization, one whose effect lasts for decades, takes generations to unravel, and whose world-spanning causes and effects are beyond a worm's eye level of observation. This last point in particular accords admirably with the premises of the cobweb model, as well as with our knowledge of the long cycle. But there are also some problems.

The Double Cobweb

One major problem with the "one-cobweb-per-long-cycle" hypothesis is that much of what we know about world politics suggests that a half-century production-information gap is a rather long one for many of the projects that are undertaken in that field. Even if the rise of a nation-state to the position of world leadership is indeed a momentous event and a massive project, altering for good the structure of the global polity, it is not by any means the only such project of structural significance over a period of an entire century. If we think of the development schedule of a major weapon system (the nuclear weapons for the United States, with six years to first use [1939--1945] and two or more decades to maturity [to the 1960s]); the establishment of a world organization (League of Nations and United Nations, with at least three decades to maturity); a major shift in alliances (the opening of China, from the late 1960s to the early 1980s); or the consolidation of an international coalition (the nonaligned nations' movement, some two decades from the mid-1950s) we have indeed major projects that have taken some considerable time to acquire substance and momentum. But they do lie within the timespan of one generation, a quarter-century, perhaps up to three decades, rather than in the half-century-or-over range. If structural change is, in part, a problem of generational learning, then twenty to thirty years would seem to be about the measure of it. And if learning is a process that does indeed play a part in the long cycle, then a "production-information" gap of about one generation seems somehow more reasonable and, given our empirically ascertained length of one long cycle at over one century, would allow for two "revolutions," that is for two cobweb cycles in each long cycle. Hence the "double cobweb."

Consider again Figure 4.2, the constant cobweb cycle. Instead of going around once, we may wish for it to move faster, at the rate of some thirty years per each half-revolution. We still get the long cycle, only now it is composed of two cobweb cycles of two phases each, each comprising one sequence of order surplus and order shortfall.

Given this analysis, and in agreement with our earlier concept of the long cycle, the following four phases of the long cycle may now be identified in the "double cobweb":

Global Order

Phases	Availability	Phase Characteristics
1. World Power	Surplus	Reaping the fruits of postwar settlement
2. Delegitimation	Deficit	Nationalistic reaction; intermediate warfare
3. Deconcentration	Surplus	Multipolar power structure; power equalization; oligopolistic rivalry
4. Global War	Deficit	Opening for new leadership

A basic difference between the double-cobweb and single-cycle model lies in the nature of an anticipated frequency of surpluses and deficits in Q_1, the *quantity of order* available in the global polity. The single cobweb predicts one glut followed by one long period of insecurity per long cycle; the double cobweb, by contrast, has a double sequence of surplus and shortfall per long cycle.

We interpret these models to imply the following rival hypotheses:

Single Cobweb: Dividing each long cycle into two longitudinal segments (T1 and T2), the net supply (or surplus) of order in phase T1 should be significantly greater than the net supply of order in phase T2.

Double Cobweb: Dividing each long cycle into four quarters (Q1, Q2, Q3, Q4), the net supply (or surplus) of order in phases Q1 and Q3 should be significantly greater than the net supply of order in phases Q2 and Q4.

At this point, we may draw attention to the fact that our hypotheses single out for testing only one of the two dimensions that compose the demand-supply situation, namely the quantity of order Q (measured on the two functions along the horizontal axis of the cobweb diagram) and that they make predictions about the behavior of demand and supply on that one dimension over time. (They leave entirely aside the other, or preference [v] dimension, both in respect of demand and supply.) In other words, the test does not depend upon the complete specification of the demand and the supply functions; it is the power of the cobweb model that makes it possible to make predictions about order deficits and surpluses because these are derived as the difference between the values of quantity of order demanded and supplied.

We now have two competing models and rival hypotheses from which to choose. Which of them accords better with the historical experience of long cycles? That is the question we shall explore in the following sections.

Operationalization and Testing Considerations

A test of the two cobweb models requires data about quantities of order supplied and demanded in the modern global system over the span of its existence, for we define net order surplus (or deficit) as in (positive or negative) difference between the quantity of order demanded and that which is supplied.

We do have data for the *quantity of global order supplied* for the post-1500 global system. According to long-cycle theory, the structure of the global system is predicated upon the distribution of oceangoing seapower, the primary and essential type of capability for projecting influence on a global scale.[8] Naval capacity is singled out as the crucial element in this analysis because, for the modern system, seapower must be regarded as a more generalized (hence more effective) medium of global power because it is more mobile, more attuned to the requirements of the global system, and more suitable in use for symbolic purposes than land armies. Thus, in light of our assumptions, the amount of global order supplied is seen as basically a function of the extent to which naval power is concentrated within the control of the global system's world power. As concentration declines, so does the supply of global order. Therefore, the supply of global order may be measured as the proportion of global naval power (the sum of naval power capabilities possessed by each cycle's set of global powers) held by the world power, and available to it for the enforcement of the status quo.

In order to measure naval power distributions over several centuries, there must be some flexibility in the units of comparison because seapower is not immune to technological change. As discussed in some detail in Thompson (1980, 1981a), we will count armed oceangoing warships in the 1500-1655 period, ships of the line in the 1656-1815 period, and naval expenditures supplemented by battleships in the 1816-1945 period.[9] After 1945, a combination of aircraft carriers (through 1959), nuclear attack submarines, and two indices (countermilitary potential and equivalent megatonnage) of the destructiveness of sea-based ballistic missiles are used to form a composite index through 1980.

A prerequisite to the creation and manipulation of these distribution indices is the identification of each cycle's set of global powers and its world power. As stipulated in Thompson (1980, 28-29), a global power must control at least 5 percent of the total naval expenditures of the global powers or possess at least 10 percent of the total pertinent warships of the global powers. A global power's navy must also demonstrate sustained oceangoing operations, as opposed to more circumscribed regional (e.g., Baltic, Mediterranean, Black, or Japan Sea) activity. These minimum requirements need not be satisfied in every year but, once a state does attain global power status, it retains that status until it is defeated or exhausted in global war and is no longer capable of qualifying as a global power in

Table 4.2 Global Power Status by Long Cycle

Global Powers	(I) 1518-1608	(II) 1609-1713	(III) 1714-1815	(IV) 1816-1945	(V) 1946-
Portugal	X				
Spain	X	X	X		
Netherlands	X	X	X		
England/Great Britain	X	X	X	X	
France	X	X	X	X	
Russia/Soviet Union			X	X	X
United States				X	X
Germany				X	
Italy				X	
Japan				X	

the next cycle. Table 4.2 summarizes the appropriate sets of global powers which emerge when these criteria are applied.[10]

We have already identified each cycle's world power in Table 4.1. To qualify as a world power, a state's capability share at the beginning of a long cycle must equal at least 50 percent of the global powers' capabilities. Even though world powers may not (and do not) control capabilities to this extent for long, we regard them as retaining their world power status until (or if) they are displaced in the global warfare at the end of a long cycle.

The demand for a global order concept presents a number of aspects. One way toward conceptualization is to regard serious disturbances (e.g., interstate wars or crises, civil wars, world depressions [Kindleberger 1973], piracy and terrorism) as indicators of the demand for greater global order. The problem here is twofold. One, assuming that we could identify all of the pertinent data, we have very little in the way of objective guidelines for weighing and aggregating the various indicators of demand. How many hostages seized are the equivalent of a war between two global powers? How many small state civil wars or border clashes equal a worldwide depression? Even if we were able to devise and justify such a scale, the data are simply not available for one long cycle, let alone four or five. At the present time, the closest we are able to approach a data inventory of sufficient historical length lies in the area of interstate wars. But even in this area, the data sets that are available (Wright 1965; Richardson 1960; Singer and Small 1972) leave much to be desired in terms of the needs for testing long-cycle theory.

We anticipate that the state of global order demand data will gradually improve.[11] In the interim, a partial index of *quantity of global order* demanded may be constructed by concentrating on warfare between the primary actors in the global systems. The measurement focus is on the number of wars going on in any given year and in which two or more global powers participate as adversaries. In addition, each war is weighted on an annual basis according to the global power participants' proportion of global capabilities.[12] For example, a year in which a global power with a 40 percent share of global naval capabilities fought another global power with a 30 percent share would receive a conflict score of 700 (.4 + .3 x 1000), if that was the only case of interglobal power war in that year. If, in the next year of war, their capability shares fell to 35 and 25 percent, respectively, the next year's conflict score would be adjusted to 600. We implicitly assert here that the quantity of order demanded is equal to the capacity (or power) required for fighting global wars.

The basic assumption being made in using this approach is that it is the conflicts of the global powers which most affect the functioning of the global polity and the course of the long cycle. Even so, all global powers are not equal in their importance to the global structure. Consequently, warfare involving, say, 20 percent of the primary actors does not exert as great a load upon global order as does warfare involving all of the global powers. A major advantage in working with a global power warfare series is that these events are anything but obscure in the historical record. Table 4.3, which provides a list of the years in which the global powers were at war with one another during the 1495-1980 period, is based on information found in Dupuy and Dupuy (1977), Singer and Small (1972), and Wright (1965).

The index creation processes described above give us two series to examine; one is a measure of the quantity of order supplied based on the world power's relative capability position and the other is a measure of the quantity of order demanded, based upon a weighted global power conflict

Table 4.3 Years of Participation in Warfare Between the Global Powers, 1945-1980

Portugal	Spain	France	England/ Great Britain	Netherlands	Russia/ Soviet Union
	1495-1500	1495-1500			
	1502-1505	1502-1505			
	1510-1513	1510-1516	1510-1514		
	1515-1516				
	1521-1530	1521-1530	1522-1523		
	1536-1538	1536-1538			
	1542-1544	1542-1560	1542-1546		
	1547-1559		1549-1550		
			1557-1560		
1579-1580	1579-1608	1589-1598	1585-1603	1579-1608	
	1621-1659	1626-1630	1624-1630	1621-1648	
		1635-1659	1652-1659	1652-1654	
	1667-1668	1665-1668	1663-1667	1663-1667	
	1673-1678	1672-1678	1672-1674	1672-1678	
	1683-1684	1683-1684			
	1688-1697	1688-1697	1688-1697	1688-1697	
	1701-1713	1701-1713	1701-1713	1701-1713	
	1718-1720	1718-1720	1718-1720	1719-1720	
	1727-1728	1727-1728	1726-1728		
	1733-1748	1733-1738	1739-1748	1743-1748	1733-1738
		1742-1748			1742-1748
	1761-1663	1755-1763	1755-1763		1757-1761
	1779-1783	1778-1783	1778-1783	1780-1783	
	1793-1802	1793-1815	1793-1815	1793-1810	1799-1801
	1804-1808				1805-1807
					1812-1815
		1854-1856	1854-1856		1854-1856

Japan	Italy	France	Great Britain	Germany	Russia/ Soviet Union	United States
		1870-1871		1870-1871		
1904-1905					1904-1905	
1914-1918	1915-1918	1914-1918	1914-1918	1914-1918	1914-1917	1917-1918
1941-1945	1940-1943	1939-1940	1939-1945	1939-1945	1941-1945	1941-1945
		1944-1945				

scale. However, we are not interested so much in these separate series as we are in the outcome of their interaction. The empirical question is whether evidence exists for a double sequence of supply surpluses and shortages per long cycle or simply a single set of surplus and deficit within each long cycle. Accordingly, we may sharpen the test focus through the creation of a single net global order series by subtracting the demand values from the supply values on an annual basis.

At first glance, one may argue that the demand (global power warfare) and supply (capability concentration) series are not commensurable and therefore cannot be merged through subtraction. On the contrary, however, the two series are operationalized in terms of the same metric--the share of the pool of global power engaged in "elite" warfare versus the share of the pool of global power available to the world power for enforcing the status quo. A zero result (net order = 0) means that the supply of order (as disposed by the world power) is roughly equal to the demand or strain placed upon it by ongoing global warfare. A surplus (net order > 0) indicates that, on the average, the world power should have the capacity for coping with the wars that come along. In contrast, a deficit (net order < 0) signifies that the world power is not in a position to cope with the demands or strains with which it is confronted.

Finally, we have divided the lengths of each long cycle into four roughly equal segments, delineated in Table 4.4, in order to create the quarters necessary for the double-cobweb test.[13] The half-cycles for the single-cobweb hypotheses are created by merging the first two and the last two quarters of each cycle.

Findings

The proposed test of the cobweb models is relatively simple. Eight half-cycle (T) and seventeen quarter-cycle (Q) means, reported in Table 4.5, are calculated for the net order series. The empirical question is then reduced to (a) the specific temporal sequence of the means and (b) the statistical significance of the differences between means adjacent in time. Support for the single cobweb requires that the T1 net order means be significantly greater than the T2 net order means within each long cycle, and that the T1 means are also significantly greater than the preceding T2 means. This pattern is partially demonstrated in Table 4.5's half-cycle means: the first half of each long cycle is characterized by relatively higher net order means than the second half, and each second half is followed by a relatively higher net order means in the first half of the

Table 4.4 Phases of the Long Cycle for Testing the Single- and Double-Cobweb Models

Long Cycles:	(I)	(II)	(III)	(IV)	(V)
Cycle Phases	1518-1608	1609-1713	1714-1815	1816-1945	1946-
Q1	1518-1539	1609-1634	1714-1738	1816-1840	1946-1970[a]
Q2	1540-1561	1635-1661	1739-1763	1841-1866	1971-
Q3	1562-1584	1662-1687	1764-1789	1867-1892	
Q4	1585-1608	1688-1713	1790-1815	1893-1945	

te: T1 = Q1+Q2; T2=Q3+Q4

[a] 1946-1970 represents the average length of the first quarter of the four earlier long cycles.

Table 4.5 Net Surplus of Order Means, 1518-1970

Long Cycles	(I)	(II)	(III)	(IV)	(V)
Cycle Phases	1518-1608	1609-1713	1714-1815	1816-1945	1946-
T1	258	-109	25	438	
T2	-180	-388	-91	187	
Q1	380	58	228	542	853
Q2	135	-269	-179	339	
Q3	188	-144	195	352	
Q4	-533	-631	-376	106	
Cycle Means	31	-247	-34	286	

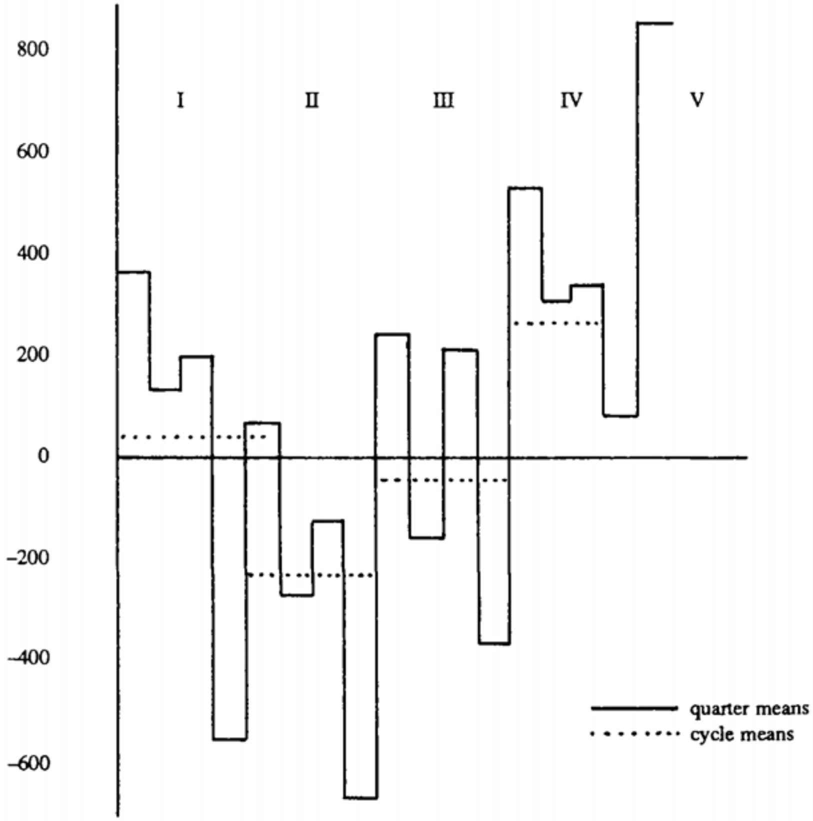
Note: All adjacent means are significantly different at the .05 level (one-tailed test) with the following exceptions--for half-cycle phases (T): I2-II1 and III1-III2 and for quarter-cycle phases (Q): I2-I3, II2-II3, and IV2-IV3.

following long cycle. Despite the sequential fit, however, some of the differences between the two sets of adjacent half-cycle means are not statistically significant. This qualification applies to the transition between the first two long cycles (I2-II1) and to the two halves of the third long cycle (III1-III2). From this conservative perspective (since we are not dealing with samples), the apparent fit of the single cobweb is less satisfactory than it seems at first.

The quarter means, associated with the test of the double-cobweb model, also fit the predicted sequential pattern. The net order means for phases Q1 and Q3 are expected to be relatively greater in magnitude than the respective means for phases Q2 and Q4. While the general fit is quite good, the differences between the means in quarters two and three are not statistically significant in three long cycles (I, II, and IV). Consequently, neither model receives perfect support. Does this mean that both models must be rejected? Our answer is no, even though we acknowledge that the statistical outcome is not unambiguous. Nevertheless, an argument can be presented that the double-cobweb model, particularly in light of our crude tests, deserves further consideration. The lack of statistically significant mean differences in two of the seven half-cycle and three of the sixteen quarter comparisons reflects, in part, the heterogeneity of annual values within phases, which renders some of the mean values less meaningful. For example, long cycle I's T2 mean value (-180) is lower than long cycle II's T1 mean value (-109), but the difference is not statistically significant. One reason is found in Table 4.5's quarterly means in the sense that the T2 (long cycle I) and T1 (long cycle II) means encompass two oppositely signed quarter means. The nonsignificantly different half-cycle means for the third long cycle reflect the same heterogeneity problem. Thus, if forced to choose between half-cycle and quarterly means in terms of their power of discrimination, it is clear that the quarterly means provide a relatively more accurate representation of the fluctuations in net order. The greater accuracy must be attributed, in turn, to the fact that quarterly means are more discriminating about the two most dominant phases of the long cycle--the initial world power and the terminal global war phases. As a consequence, all of the mean differences in the quarterly transitions between long cycles are statistically significant. It is the weaker delegitimation and deconcentration phases that are more difficult to tell apart.

A second reason for not dismissing the double-cobweb model too quickly has to do with the intriguing evolutionary patterns readily discernable in the quarterly mean values. Putting aside for the moment the first long cycle, the net order means for each respective quarter are higher in each successive cycle (see also Figure 4.3) for graphic representation). Not coincidentally, each cycle mean is also higher than the one that precedes it. One may there-

Figure 4.3 Surplus of Order Means, 1518-1970



fore conclude that each successive world power, beginning with the Dutch era, has enjoyed and displayed a greater capacity for managing the problems of the global political system. Even so, it is not until the second British long cycle (1816-1945), corresponding to the emphasis of historians on the achievements of the *Pax Britannica*, that a positive cycle mean is achieved. One may also conclude that, over time, the quality of order has shown a steady improvement.

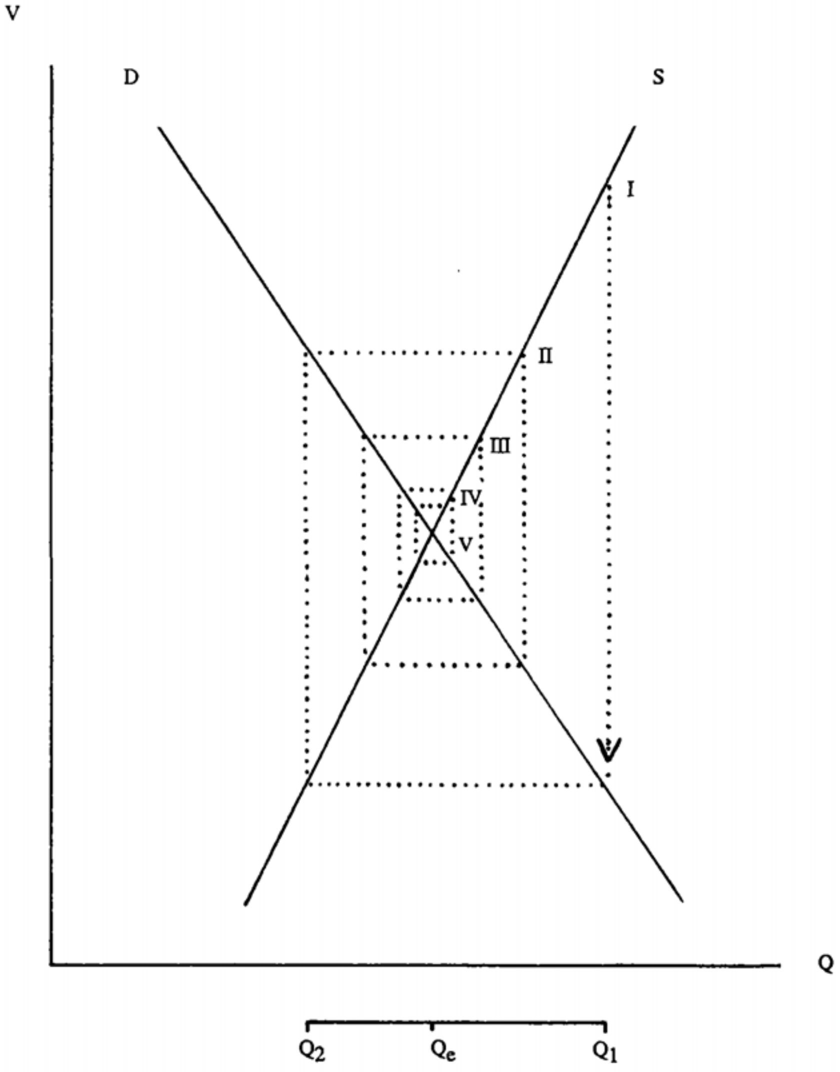
The precise forms of fluctuations in the amount of net order available in each long cycle obviously are not identical from one long cycle to the next. But the direction of change is encouraging as a sign of gradual political development for the global system. The apparent exception to this generalization is the absence of improvement in the mean values observed in the transition from the first to the second long cycle. One way to interpret this is to say that the first (Portuguese) long cycle has special characteristics due to being the start-up cycle. Portuguese activities in the Indian Ocean and Atlantic inaugurated the modern era of world politics and played a pivotal role in shifting the center of politicoeconomic gravity away from the Mediterranean and to the Atlantic-bordering maritime powers. But, in many respects, Portuguese leadership was established in conditions of low information and, consequently, in the absence of much competition from other global powers. In particular, Portugal did not ascend to world power as the victor of global combat. Once serious European competition did emerge, Portugal was unable to maintain its leadership for long and, so far, it is the only world power to have suffered a conclusive defeat and loss of political autonomy (1580) prior to the advent of global war (1585-1608). For these several reasons, the first long cycle has special features not full comparable with the cycles that have followed.

A Converging Cobweb

So far, we have tested two variants of the constant cobweb, the crucial assumption being equal elasticity in the demand and supply schedules. The time has come to raise a question about that assumption because, as noted earlier, unequal elasticities tend to produce sequences of quite different cycles: if demand shows greater elasticity than supply, the cobweb will tend to converge toward the point of intersection, as in the upper portion of Figure 4.4; in the reverse case it will diverge, in an explosive fashion, away from that point of equilibrium.

There are reasons for arguing that, in the experience of the modern world system, the supply of global order has been more inelastic (less flexible) than the demand for it. Our main empirical support for that argument is the small number of states competing for global power status. Over a period of one half-millennium and on the evidence of Table 4.2, a total of not more than ten states have qualified in the world power stakes. As four of these became world powers, only about six have put up any serious competition to the occupants of the role of world leader-

Figure 4.4 The Converging Cobweb



ship. Because of the existence of barriers to the entry of new producers and the immaturity of most nation-states, the supply of order can hardly be said to have been plentiful or adequately responsive to world needs. The consumers of global order may, on balance, have been somewhat more flexible and sensitive to the recurrent periods of instability and insecurity.

If we are right in positing the possibility of relatively greater elasticity for the demand function in the modern global polity, hence of a converging cobweb for the long cycles (as in Figure 4.4 showing a single revolution per long cycle), then the pattern of the output of order would be one of the extremes of surplus and shortfall gradually converging toward the equilibrium level Q_e, a notion that is compatible with the findings reported in Table 4.5 and Figure 4.3.

Conclusions

1. The concepts of supply and demand, as related to global order, appear serviceable in organizing large segments of centrally significant information about world politics and, in particular, thus serve to give focus to the analysis of world leadership and its cyclical fluctuations.

2. Models of the cobweb cycle seem to have prima facie relevance to the analysis of long cycles. Of the models examined, the double-cobweb cycle, with its fourfold beat and the prediction of a double sequence of order "surplus" and "deficit" in each long cycle, is the model best supported by our empirical evidence.[14]

3. We have developed and tested a new theoretical explanation for the often argued relationship between capability concentration and systemic warfare (Singer, Bremer, and Stuckey, 1972; Modelski, Johnston, and Wu, 1979). The relationship between "predominance," "parity," and conflict appears to be neither positive nor negative but nonlinear instead. "Predominance" (high capability concentration in the World Power phase) gradually gives way to a situation resembling "parity" in the third and fourth quarters of the long cycle. During that process of structural transformation, warfare, at least between the global powers, tends to be relatively less likely in the first and third quarters and relatively more likely, subject to certain evolutionary considerations, in the second and fourth quarters. Contrary to prevailing images of the lack of structure and predictability in international politics, this cyclical pattern has repeated itself for nearly five hundred years. It is true that four completed long cycles in one system may appear to provide a limited database upon which to generalize.

Yet, the tremendous significance of the global political system to the creation and maintenance of global order--and the rather low probability that many of us will live long enough to observe a substantial increase in the number of completed long cycles--suggests that we should not be overly cautious in recognizing what appears to be the most salient political dynamic of the modern world system.[15]

Notes

1. The long cycle of world leadership approach differs in important respects, i.e., from the world-economy perspective on the world system as formulated by Wallerstein (1974, 1980); for a discussion of differences, see Rapkin (1980) and Thompson (1983).

2. We distinguish the global polity from regional and national political systems, as well as from economy and culture, both at the global, and at regional and national levels.

3. Nor do we therefore regard the output of the global polity as a commodity, because commodities are objects produced for sale in the market.

4. In the literature, this point may be controversial but such studies as Singer et al. (1972) did not produce unambiguous results on this question. Our concept of "world power" emphasizes global (and therefore naval) capabilities and intentions rather than involvement in European warfare and military capacity in general, and it is not therefore exactly comparable to earlier formulations.

5. The fact that the world powers are also major beneficiaries and consumers of global order they produce may seem awkward but need not interfere with our analysis.

6. The classic formulation of generational effects has been Karl Mannheim's. For the concept of political generations, see Rintala (1968, 92-96), or such recent studies as R. Inglehart's The Silent Revolution (1977).

7. Compare Boulding's (1978, 38) model in which the war-peace cycle proceeds in a space whose coordinates are "strength," and "strain" bearing on that strength.

8. The emphasis on seapower is not meant to deny the significance of commercial marine, industrial, financial, and general economic capabilities that are related to the successful development of maritime armed forces.

9. A very large number of sources, listed in Thompson (1980), were consulted in creating the naval capability series. In addition to the application of several decision rules for counting and comparing "ships of the line," each global power's post-1815 naval expenditure series is first deflated according to information on wholesale price fluctuations and then converted to British pounds sterling at the 1913 exchange rate. However, determining actual expenditure levels during periods of global war (1914-1918 and 1939-1945) is an extremely difficult process. Consequently, we have relied instead on information on the distribution of dreadnought battleships during these twelve years.

10. Given the specific emphasis on naval capabilities, all of the traditional great powers do not qualify as global powers. Sweden, Prussia, and Austria-Hungary are three examples of sometime major European states that failed to develop a naval capability for global reach.

11. Operationalizations of demand other than those relying on conflict data will also be explored.

12. An earlier use of capabilities as weights may be found in Modelski, Johnston, and Wu (1979).

13. The fourth quarter of the fourth long cycle encompasses fifty-three years. This procedure is attributable to the American refusal and the British inability to assume the mantle of world power at the end of World War I. If a new world power had emerged in 1919, the fourth long cycle's length would have been quite similar in length to the lengths of the first three cycles. But, a new cycle can begin only when a new world power emerges. Consequently, we have merged the 1919-1945 extension with the 1893-1918 period to form one long quarter of Global war.

14. It may also be worth noting that the finding of relative order surplus in the first and third phases and relative shortfall in the second and fourth phases is corroborated to some extent by a recent investigation of the relationship between global political and economic processes (Modelski 1981). It would appear that since the 1760s, that is for the duration of the Industrial Revolution and in parts of three long cycles, phases one and three have been periods characterized by stable or declining prices, especially in the dominant national economy, while phases two and four have been characterized by high or rising prices. Thus periods of high prices in the global economy--characteristically those of resource shortages and slow economic innovation--are also those of global order shortage; hence those periods in which a high priority (high valuation) is being attached to the production of security goods and political innovation. Conversely, periods of relative order surplus seem to be associated with stable prices and general economic expansion. However, Modelski's (1981) "quarterly" periodization is based on economic price fluctuations and is therefore not exactly identical with the quarters created in this study.

15. Other avenues for exploration are suggested in Modelski, Johnston, and Wu (1979) who argue that different types of conflicts, as opposed to the simple frequency of conflicts, should be expected in different phases of the long cycle. Of related interest is Small and Singer's (1979) finding of compatible fluctuations in the frequency, magnitude, and intensity of not only post-1816 interstate warfare, but also in terms of intrastate civil wars. In addition, Organski's transition model (Organski and Kugler 1980) and Doran and Parson's (1980) relative power cycle model appear to possess some potential for conceptual integration with long-cycle analysis, but at a different level of analysis.

5

George Modelski

A System Model of the Long Cycle

The broad outlines of the succession of world powers in the modern world are now quite well established. Even while the precise status of Portugal remains controversial, there is fairly good agreement, among students of international political economy, on the identity and position of the more recent occupants of the role of world leadership: the United Provinces of the Netherlands, Great Britain, and the United States. Similarly, among students of war and strategy, a consensus is gathering around a list of periods of major warfare that are sometimes referred as general wars and that are here called "global wars": at the minimum, World Wars I and II, the Napoleonic Wars, and the wars of Louis XIV figure on all such lists (Levy 1985; Thompson 1985).

The theory of long cycles brings together these two sets of phenomena, and the "periodic table" schematizes the data that constitute the empirical core and the descriptive substance of that theory (see, in particular, the discussion in Chapter 1, and Table 1.1 on page 4).

The "periodic table" shows how the "modern" period of world politics, since 1494, may be seen to be composed of five cycles, each launched by a global war--that is, a contest between a major challenger and a general coalition; one member of the latter then emerges as a world power whose leadership becomes central in the postglobal war phase of the process. This leadership continues, albeit at a weaker rate, into the two phases of diminished order, until the whole issue is submitted to another test of global war. These, then, are the essential terms of the theory: one long cycle (of some 100 years in length), consisting of the four phases of global war, world power, delegitimation, and deconcentration.

On this account, the global political system of the past half-millennium has had two sets of characteristics. First, its record to date displays a recurrent pattern of global wars followed by leadership selection and succession. The pattern is directly linked to the management of that system at the behest of a world power, a state that is concerned with creating and developing the global system, and resolving crucial problems arising out of its operation. In the past, leadership in the global polity never fell to the most powerful actor in the European system. Rather, the ability to remain on the peripheries of the European, as well as Asian, systems, enabled the world power to devote its talent, energy, and resources to operations at the global level. Conversely, the preoccupation with gaining control of the European system handicapped the greatest of the unsuccessful challengers for that role, including Spain, France, and Germany.

But the record, to date, displays not only recurrence, as might be expected in a circular process, but also evolutionary characteristics that are closely linked to the cycles. Each world power not only managed the system in a political way but it also effected significant political innovations (in management, in strategic arrangements, or diplomatic machinery). Each successive world power has also been larger, wealthier, more powerful, and more effective than the preceding one. A progression may be observed in the quality of leadership--but also in the size, scope, and lethality of the global wars that produced these world powers.

Overall, then, the pattern has been a combination of recurrence and growth.

A System Model of Long Cycles

Accumulated empirical and historical evidence of five centuries of world politics thus summarized is suggestive enough to warrant asking questions about the meaning of it all. What models might explain these significant processes and help organize their analysis?

The Sources

For building models, there are, of course, bodies of knowledge that might usefully be drawn upon. The first one is that which has grown, over the past three centuries, around the traditional concept of the balance of power. This is a vast array of literature spanning the fields of history (e.g., Guiccardini, Gulick, Toynbee), international law (Vattel), policy debate (Cobden), and the more contemporary writing with a realistic bent (such as Morgenthau). The balance of power has formed the central core for understanding that part of modern international relations, including the most up-to-date part of it, the balance of terror.

The second body of relevant literature centers on the concepts of modernity and capitalism and asks even broader questions about the character of the modern world and the direction taken by its evolution. It derives from the "long" nineteenth century's founders of the social sciences, including Adam Smith, Auguste Comte, John Stuart Mill, Karl Marx, and Max Weber, who generated the basic questions asked in the twentieth century, *inter alia*, by macrosociologists, and in particular Talcott Parsons, and most recently by students of international political economy. Among the interesting findings of students of modernity and capitalism, and of the links between politics and economics, has been the documentation of the lead role played in that process by powers such as the Netherlands, Britain, and the United States. The modernists' task has been to explain the shape of our world and chart its future course--a hopeful approach that could, on occasion, include a dose of utopianism.

For those who look for it, then, the literature offers strands of thought that document the themes of both recurrence and of growth. The long-cycle perspective draws them together and uses them as foundations. More precisely it is located, in the first place, in that part of the literature of international relations that, since 1945, has traditionally been concerned with the theory of the subject, and with "international systems" in particular. But it also belongs to the social sciences, in general, and is indebted, in particular, to the Parsonian tradition of theoretical analysis of social systems, attempting to link the major concepts of that analysis with long-cycle processes in a manner potentially of much broader relevance. On those bases, a systemic model of long cycles can be attempted.

Components of the Global Polity

Long cycles being a political process (one whose prominent characteristics are global wars and lead powers) the relevant system that experiences long cycles is the global polity. One long cycle is the global polity moving over a trajectory of some 100 years. The long cycle, then, is a dynamic perspective on the global political system. What is the global polity?

In contrast to the concept of the "international system," an aggregate of states in mutual interaction, the global polity may be viewed, within the global system, as a specialized management network for the organization and regulation of global problems, structured by all the global powers but centered on the relationship between the world power and its challenger. It may be distinguished from the global economy (the networks of long-distance and intercontinental economic relations that also significantly center on the lead economy), the structures of solidarity (such as elite linkages and core alliances), and those of information and education (such as early geography, contemporary media, or universities networks) that help to maintain and reproduce the global culture and the system itself. The global polity is therefore, in the first place, a subsystem of the more inclusive global system that, in turn, is a component of the modern world system (which consists of local, national, regional, and global systems).

In the spirit of systems analysis (Laszlo 1972, 98), the global polity (as all systems, physical, biological, and social) might be thought of as being made up of the following four major components:

1. The world power, and the relationship between the world power and its challenger, both central to the system's identity and coherence
2. The regulatory mechanism that governs it
3. The developmental mechanism that accounts for its evolution
4. The relationship it maintains with the subsystems of the global system that are coordinate with it:

the global economy, the structures of global solidarity and of culture-maintenance, and with the systems that are superordinate to it (global, modern world, and world)

Components 1 and 4 account for the system's identity and origins. Components 2 and 3 are feedback mechanisms that embody a cybernetic hierarchy of controlling factors (Parsons) in which the symbolic elements that are higher in information control others (brute force factors), which are relatively high in energy. The latter, in turn, condition the problems that arise in the next cycle. If all systems have these mechanisms, then all systems cycle.

Identity: World Power and the Challenger

The role of world power that evolved, out of the model first provided by the Portuguese nucleus, into such successful examples as Great Britain or the United States has been central to the operation of the global political system. As noted, it supplies the leadership and the tools for meeting global problems, and it organizes and coordinates the relationships between the political and other subsystems at the global level. That is why the most convenient way to identify the successive cycles is to name them after the world powers that shaped them.

The world power is central, too, to the relationship that emerges with the major challenger. This is the world system's relationship of major tension and it has, in the past, ultimately culminated in global warfare. While clearly fraught with dangers, it is also possibly a creative relationship; it has been argued at high levels of generality (Levi-Strauss 1976, 359-360) that coexistence of antagonistic political and social regimes might help to maintain that diversity without which an evolutionary system of cumulative change would be unlikely. The U.S.-Soviet relationship, which has been central to world politics since 1945, appears to fall into this category.

The world power is critical to the functioning of the global system but is not really essential to all the transactions that proliferate at the regional and national levels. Periods of global leadership by world powers, the Netherlands or Great Britain, were not immediately incompatible with, for instance, French ascendancy in Europe, say circa 1685, or the Bismarckian system between 1870 and 1890.

The Problem of Origin

Given identity, what accounts for the origin of the global political system? Let us explain this process as the product of the working of the systems superordinate to the global polity: the global system, and the modern world system.

The global political system is a subsystem of the global social system. It is, as of today, still a relatively undifferentiated subsystem of the global (intercontinental) level of interaction. That is, global political functions are not located in well defined global-level structures; the critical functions (such as those of global-reach military and nuclear organizations) have, in fact, been residing in mixed, national, and global-level structures of the major powers.

Useful at this point might be the model proposed by Ilya Prigogine (Jantsch and Waddington 1976, 117 ff) for the analysis of dissipative structures, which are those that persist in spite of entropy. Prigogine's purpose is to explain how "order" can arise out of chaos; he argues that "dissipative structures form by a *nucleation process*" in the presence of catalytic agents, and of critical fluctuations, those that go beyond a critical threshold and become the prerequisite for the appearance of "chaotic" instability.

In 1500, global political structures were even more rudimentary and even less differentiated. All that can be said is that a bare nucleus existed around which global operations began to take shape: the court of Portugal, the king's navy, and the commercial and other networks that gradually began to be spun. All that needs explaining is the emergence of that nucleus.

In the immediate sense, the "critical fluctuations" were, around 1500, the global war that reached from Italy to the Indian Ocean, and the wide-ranging activities of the Portuguese, and then the Spanish crowns. More basic still, might have been the shock waves created by the "cataclysmic conquests" (McNeill) of the Mongols some two to three centuries earlier; these laid waste much of Asia and Europe but spared Western Europe and Japan, and established links across the entire Eurasian landmass. These "critical fluctuations," moreover, occurred in the presence of catalytic agents such as gunpowder, the compass, and the printing press. That is how new structures formed that became the nucleus of a world power institution that came to give identity to the global system despite the regular succession in the occupancy of that position. So much for the birth of the nucleus of the global system. It accounts for the "how" or the mechanism of the emergence of a global polity but not for the "why" or the causation. For that, explanations might have to be sought at the next higher systemic level, that of the world system.

The conventional view puts the emergence of the modern world system at around 1500, to coincide with what has just been described as the nucleation of the global system. But even if its birth might correctly be depicted in this way, nagging questions remain about the sources of this development. For momentous changes of this kind do not usually occur unprepared. To explain the birth of the modern world circa 1500, it might be necessary to explore the possibility of a substantial period of gestation going back to about the year 1000 A.D. Vigorous and synchronic growth at both ends of the Eurasian landmass, in China, and in Europe, approximately doubling the population between 900 and 1500, created the preconditions for change in the world system, and set it on its modern course. Increase in size set in motion the process of vertical differentiation such that, gradually and after a suitable interval, what was previously a system of largely isolated, two-tier, imperial societies gave rise to a more complex four-layer system of local, national, regional, and global interactions. The next phase of the modern world system thus created, as the standard political, and social, institution at the national level, the nation-state, and generalized it into a nation-state system; at the global level, it produced, as just noted, the nucleus of an organization of global reach around the world's first successful nation-state.

Indications are that links also exist between the long cycle and the coordinate processes that characterize the functioning of other subsystems of the global system: They are, (a) for the global economic system, the Kondratieff-Schumpeter process of the rise of lead industries (such as the railroad industry) and the steel-chemical-electrical industries in the nineteenth century (two Kondratieffs might account for each long cycle); (b) the creation of new structures of global solidarity that seems related to the ascendancy of major political parties of the world powers; and (c) the passing of generations, where four generations might account for each long cycle.

All these processes might well be nested in a pattern of gears within gears. The lifespan of one generation seems a good explanation for the length of one phase of the (four-phase) cycle and also for the slowly lengthening period of that cycle. The intermeshing of these several processes also would help explain the regularity observed by all of them.

Positive and Negative Feedback in the Long Cycle

Having reviewed the components of identity and origin, (items 1 and 4 on Laszlo's list) let us now turn to the feedback processes that are the remaining two items on that same list. In doing so, we need to contrast this type of system analysis with conceptions that lay stress on input-output functions. These latter may be more appropriate to performance types of systems such as machines, or short-run arrangements in which the structure may be taken as invariant and for which linearity, that is, an output response that is directly proportionate to input, is an appropriate assumption (as in the systems analyzed by Cortes, Przeworski, and Sprague 1974). But in learning processes, in which the system itself and its structure are changing, through long-run processes in which nonlinearity is the more useful assumption (for instance, where information is involved), the emphasis belongs to arrangements that govern that particular system, especially its forms of self-regulation and the modes of its growth. That is where we turn to the notions of feedback.

The property of being able to adjust future conduct by past performance is more than a logical necessity in social and political systems, and that is why it has not gone unnoticed in the literature of political science. In *The Nerves of Government* (1963), Karl Deutsch devoted considerable attention to both positive and negative feedback. David Easton (1965, 381-409) presented a four-phase, nonlinear feedback loop as basic to all political systems. It is fair to say, too, that in more recent work these concepts have had scant application in political analysis. However, taking note of the fact that the literature briefly reviewed at the beginning of this chapter suggests both recurrence and growth to be significant features of global political arrangements, we shall now ask how to conceptualize these as negative and positive feedback.

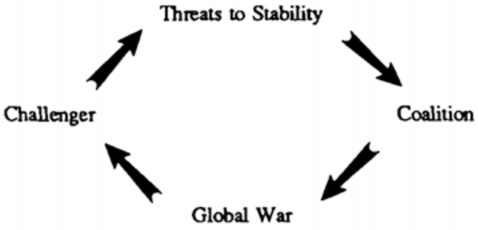
The Regulatory (or Balance-of-Power) Loop

Critical to understanding world politics is the process of power balancing, which students of the subject often view as of the very essence of international politics. It may be described as a regulatory process because it is, in effect, a negative feedback loop: it works somewhat like a thermostat in which an input of information about temperature controls the output of heat in the system. In the global political system, information about a rise in tension created by change and friction leads to a cutback of activities that promote these and focuses attention on questions of order and stability.

This may loosely be described as the balance-of-power loop of the long cycle, and it works roughly as follows: a challenger to the status quo creates a systemic perception of threats (negative problems) that appear to destabilize international politics. On past experience, these threats were closely bound up both with the stability of a critical region of the world system (Italy, then the Low Countries, then Western Europe as a whole, and, at present, possibly Western Europe together with Japan) and with the accomplishment of major systemic tasks such as conserving the fruits of exploration, resolving religious wars, or leading the industrial revolution. Challengers have usually been seen as centrally situated and continental, capable of exerting pressure in several directions, and needing to be contained by far-flung coalitions.

This information input, the perception of a threat, has operated as the cement that binds a variety of states, in forms such as core alliances (between the old and the newly emerging world power) or in general coalitions, in particular those that fought in the bouts of major warfare. It has been the experience of the past five centuries that the general coalition, coordinated by the world power and basically oceanic in orientation, invariably prevailed over the continental challengers (Spain, France, Germany) in the acid test of global warfare. The continental challenger was usually isolated internationally and claimed being encircled or blockaded. The oceanic coalition has been notable for the regularity of its victory, as well as that of its eventual break-ups ("coalition fracture": cf. Modelski 1984): one of the key members of the coalition left the winning side and assumed the role of challenger in the next major round of the long cycle, ending up as the principal opponent in the next global war. Brandenburg-Prussia, for instance, joined the Dutch-led coalition against Spain, and in two subsequent global wars was a critical component of anti-French alliances; but, in the nineteenth century it became the core of the new German state and, as such, fought World Wars I and II on the other side of the great oceanic-continental divide. Russia was aligned with the oceanic coalition through three global wars but has, more recently, emerged as a prime challenger to the United States.

The regulatory loop may be represented thus:



The novel proposition is that global wars produce new challengers; the mechanism of that process is the fracture experienced by the winning coalition. Two other propositions, that systemic threats engender coalitions and that general coalitions beget global wars, and win them, are more in line with balance-of-power doctrines as traditionally conceived. The last proposition, that challengers threaten the stability of the system, also supports the received wisdom but needs to be interpreted with care in light of the system's requirements for tension mentioned above.

The Developmental (or Evolutionary) Loop

The other, positive, feedback loop powers and directs the processes of growth and evolution that are just as essential to the working of global politics as the regulatory one. All such "development" is an exponential process that cannot continue forever unchecked and, from time to time, requires damping, slowing down, or rechannelling, for it would otherwise tend in a "runaway" direction. Because the process feeds upon itself, each completed cycle creates the conditions for yet higher performance in the next, in a chain reaction that is potentially explosive. Rapid population growth is a standard example of a social exponential process; economic growth is another. Neither can go on without end.

Just as a global war, in the regulatory loop, in time generates a challenger, it does even more surely select from among the candidates for the position of world leadership. Among the more interesting points of the theory of long cycles is that, whereas global wars are the general selection mechanism for such leadership, that selection is far from random: it goes to those states that best satisfy certain well defined criteria. On the five past occasions, these criteria have included (1) insularity, or peninsularity, for geographical location; (2) lead status for the economy; (3) open, coalition-capable, and party-organized societies; and, (4) a political capacity for global reach, which in the first four cycles manifested itself in sea power and, in the fifth cycle, has come to include air (and may also include space) power.

The world power accomplishes the principal global tasks in the period following the global war. This is the era of administering world affairs and stimulating a rapid growth of the world economy. Once this is accomplished, the stage is set once again for the exercise of leadership, but this time it is directed to a new set of problems.

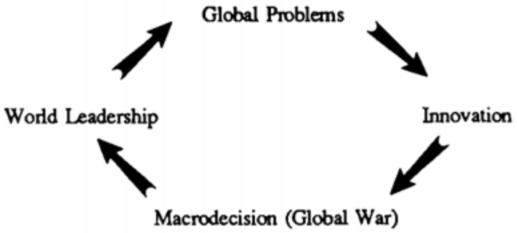
The global polity regularly engenders new problems and so does the global system as a whole. The other major insight brought out in studies of the long cycle is that these problems are not random or even unexpected but do, in fact, occur in a distinct pattern that is related to the shifting functional requirements of both systems. This makes them, at least in principle, predictable.

The modern global system, for one, may be argued to have completed, in each long cycle, one major systemic requirement in a sequence that, following Parsons, Bales, and Shils (1953), may be interpreted as a learning process. The first cycle, viewed as the initial phase of the newly emergent global system, saw Portugal seizing the challenge of the discoveries and completing the most active and mind- and space-expanding operation of the Renaissance. The United Provinces of the Netherlands, in the next cycle, issued successfully from the wars of religion and laid the foundations of the Dutch-English-American network that became the working nucleus of the new global system. Great Britain, in its first cycle, established the operating characteristics of the modern state and, in the second, those of the modern economy. As a sequence, these four cycles and these four powers may be seen to have been responding to the changing needs of the global system as they moved, in the Parsonian terminology, from "pattern maintenance" (culture production and reproduction) to "integration" (solidarity creation), "collective goal attainment" (politics), and "adaptation" (economics).

In the developmental loop, therefore, the first stage is one of new information, a clarification of the situation, and a resetting of the agenda with active participation of the media. As the problem is laid out and defined, for instance, in the course of the discoveries by Portugal, say, between 1430 and 1480, or in the case of the industrial revolution in Britain, between 1760 and 1780, learning takes place and innovations are introduced. The Portuguese explored the Atlantic, and designed and built new types of ships; in Great Britain, the machine-factory system was invented and encompassed a panoply of technical innovations.

In the second phase of coalitioning, the innovators develop a constituency, and cultivate alignments with established social interests. What is then needed is a macrodecision process that approves, ratifies, and then diffuses the innovation as legitimate for the entire global system and not just for one particular country. In the past five cases, this systemic decision process was the global war because it selected and confirmed the world leadership and, implicitly, the learning process with which the occupants of that role were identified. In the postwar phase, the practice of learning is broadened, the innovations become widespread, and their success is confirmed through successful administration. The same sequence applies to political innovations proper--in particular, those concerning the global polity. Thus the United States, in both world wars, took the lead in the post-European transition, placing the management of the global political system on a new basis of continental proportions, forming new international organizations, and giving more stable and continuous attention to global problems (see Table 1.2 in Chapter 1).

The basic developmental (or evolutionary) loop may be represented as follows:



The output of this loop is the solution of global problems (the arrow from world leadership to global problems). An insight afforded by this analysis is, however, that the global polity, just as the entire global system, is a "learning machine" that does not merely process routine problems but, rather, is capable of changing to cope with new problems as they arise. New problems are not occasions for stalemate or catastrophe but opportunities for learning, and they create a demand for innovations. Those innovations will be favored that respond to global problems--that is, those that respond to the most urgent current functional requirements of the system.

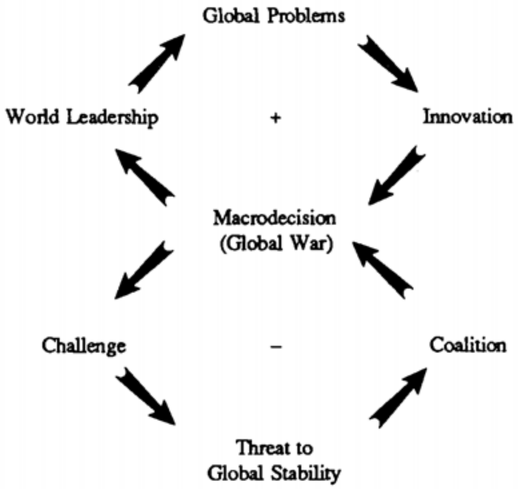
Every innovation is also a call for a decision; it creates and proposes schemes for change in the status quo around which political debates necessarily revolve and new coalitions must form and reform. The larger the coalition for change, the easier the ultimate decision. But there must be a systemic decision, and it is the systemic decision alone that can clinch the future of innovation at the global level: for instance, against Philip II of Spain, who tried to put the clock back on the Reformation; or Louis XIV, who tried to remake Europe in his own absolutist image; or against Hitler, whose policies were incompatible with the entire thrust of modern world development, especially in regard to culture, education, and information. Systemic decisions which took the form of global war, selected the type of world leadership that furthered urgent systemic goals;

however, the essence of the process has been not global war per se but, rather, the decisional element it embodied.

Double Feedback and Macrodecision

The two processes just outlined--the regulatory, balance-of-power process and the developmental, evolutionary process --are linked to each other in a variety of ways. Significantly, the fourfold pattern of each (positive and negative) loop reflects the four-phase division of the long cycle. Each such phase represents a net balance between the positive and the negative stages of the feedback process. More generally, each long cycle is shown to have built into it mechanisms of both recurrence and growth.

By now, it should also be apparent that the most obvious "coupling" between them, that is the phase that is most obviously common to them both, is global war or macrodecision. That is what clearly links the two processes, as is shown below.



The macrodecision that takes the form of global war has certainly played a major role in the long cycles of the modern world and in the dynamics of the global political system. It was the process or mechanism that selected world leadership and generated challengers, and coordinated the timing of both the positive and the negative feedback loops. It is noteworthy, however, that its function is not that of global war as such, but rather a more generalized one of systemic decision-making--an opportunity for a political system to make a decisive choice, one that commits the global system on two crucial points: (1) the character of its political leadership and the occupancy of its chief offices, and, (2) the priority program of public policy for global problems to which the global system (although not really the world as a whole) will be committed for the next two to three generations.

This concept of global war as a decision mechanism central to the global political system recalls David Easton's definition of the political system as that "set of interactions through which . . . binding decisions . . . are made and implemented for the society" (1968, vol. 12: 285). Past global wars have constituted fundamental decisions about the course of human society, and their results have been binding and lasting but not everlasting. Their "bindingness" tended to wear out over time, and therein lies the tale of long cycles.

In essence, then, the global war has played, in the global system, a role that, in well-run national and local systems, is performed by the regular election process. All functioning political systems have to provide for political succession and for the replacement of old leadership by a new team, as well as for choice among policies competing for implementation. Some do it by elections, some by coup or civil war, and yet others by bureaucratic maneuvering, secret infighting, and cooptation. It cannot be stressed too strongly, or repeated too often, that in past cycles, the global war has played a role analogous to civil war in national politics, one which is susceptible to analogous remedies.

Dimensions of the Global Polity

The system model just outlined suggests the following as the basic dimensions of the global polity: (a) polarity, measuring the distribution of power in the global polity; (b) system-time, describing the phase in the unfolding of the long cycle; (c) coalition, expressing the strength of cooperation for, and the value attached to, innovation; (d) macrodecision, determining the leadership of the global polity.

The polarity dimension concerns the distribution of capacity for global reach, that is, ultimately but not immediately, the power to organize, or to prevent the taking, of macrodecisions. It yields an estimate of the likely outcome of such a decision, that is, an estimate of the likelihood of victory in global war (or some future alternative to it). It tells us about the haves and have-nots of world politics. It measures the resource and energy structure of the global political system.

The system-time dimension concerns the time it takes for the system to reproduce itself, or for the cycle to reset itself. It measures the length of the long cycle, from the beginning of one cycle to the beginning of the next, and is the clock of the entire process. It records the time differentiation of the global political system as a sequence of major events.

The coalition dimension depicts the distribution of support for and against the resolution of global problems, for innovation and learning, and the strength of forces for change and the viability of those fighting to maintain the status quo. It refers to the distribution of goals and preferences --in particular, as between the positive and the negative ones. It tells about the emotional tone of global politics and the resulting balance between dreams and fears, ideals and reality. It is about progress, and about conservation, whether the system is moving "forward" or "backward." It measures the community/coalition potential of the global political system.

The macrodecision dimension refers to the resolution of the relationship between leadership and opposition, between those constructing an order and those opposed to it. It is the conflict dimension because it tells us about the winners and losers of global politics: who is up and who is down, who in the near future will implement policy and who will follow.

At least in principle, each of these four dimensions is capable of empirical measurement. We already know that, in respect of polarity, measures of sea power have been made and are shown to be good indicators of the distribution of resources for global war over the entire timespan of the global system (cf. Chapter 1 and Figure 1.1). They are an excellent predictor of the likelihood of victory in the macrodecision that has been global war because, throughout, a decisive naval battle was a necessary, although not a sufficient, condition of such victory. The sea power indicator does excellent service over the entire timespan of the modern epoch, but it can be usefully supplemented by measures of the distribution of economic power.

System-time is at the very heart of the study of long cycles. Well done, such studies should tell us "what time it is" (Thompson 1983b, 37) in world politics. At present, different approaches to world-system analysis tell us a different time but, ultimately, this matter ought to be accessible to empirical verification by current methodologies. The periodic table of long cycles is a device for measuring system-time and the best yardstick of it, to date, is the time elapsed between two global wars.

Measurement along the coalition dimension is hardly inconceivable, although systematic effort yet remains to be undertaken. Macrodecision, finally, is the stuff of high politics; it is the product of global war, and that is the ultimate measure of it.

Why are these the basic dimensions of global politics? For one, they are implicit in the model of double feedback. More generally, they evoke the four functional requirements of the global polity and, most generally, those of the world-system (see Hare (1982) for the concept of social space, and Wright (1955) for the notion of the world as a field). At any given point in time, the global polity occupies a position in global political space that is defined by these four coordinates. The long cycle might then be the path described by the system in that space. The task of mapping that path remains.

Note

This chapter benefitted from the comments of Stephen Majeski.

6

David P. Rapkin

World Leadership

In classical theories of international relations, states are atomistic, autonomous, and formally equal; the world system formed of these states is thus ordered on a horizontal, or anarchical, basis. This emphasis on horizontal structuring of like units has relegated the concept of world leadership--which connotes hierarchy, or verticality of structure--to peripheral theoretical and empirical status. Because instances of world leadership seem much less frequent than "statistically normal" horizontal relations, leadership has been invoked for explanatory purposes only when necessary to shore up classical theories, strained by what, at times, is a decidedly nonhorizontal world. In the classical view, it is fair to say, world leadership is a *sui generis*, even aberrational, phenomenon that requires no more than auxiliary theoretical treatment.

In contrast, the emergent theory of long cycles of world politics (Modelski 1978, 1982) elevates the leadership concept to central importance. From a long-cycle perspective, there are recurring events, processes, and phases of world system history that cannot be comprehended in horizontal terms, i.e., without reference to a state extraordinary in both the ends it seeks and the means it employs. In particular, activities to build and maintain order on a global scale require the exercise of leadership, insofar as such activities imply (systemic) objectives and necessitate (preponderant) capabilities that are infeasible and unavailable, respectively, to "ordinary" states, even those in the traditional "great power" category. Indeed, the importance of world leadership to long-cycle theory stems from its relationship to world order, with the two properties--leadership and order--metahypothesized to wax and wane jointly in a phased, cyclical process of roughly a century's duration.

There is not yet a full-fledged theory of world leadership. Long-cycle research, to date, has concentrated on operationalization and demonstration of cyclicality in key systemic processes on modeling the relationships among them (Thompson 1980; Rasler and Thompson 1983, 1985a, 1985b). Within this research program, leadership has been given empirical content indirectly, its phases imputed from cyclical fluctuations in various systemic processes (e.g., the distribution of strategic capabilities, global, war, and economic growth). Only recently has explicit attention been given to specifying the necessary external and internal conditions of world leadership; the characteristic functions of the role and its evolution toward greater functional complexity; and, the domestic and international causes of the deterioration of leadership (Modelski 1983a, 1983b, 1984).

Much remains to be done, however, to develop a theory of world leadership. An assortment of existing theories can be brought to bear on this task, including theories of personal leadership, the public goods emphasis of hegemonic stability theory, Wallersteinian theory's version of world economic hegemony, and structural Marxist theories of the capitalist state. The objective of this chapter is to synthesize elements of these and long-cycle theory to form a conceptual framework for examination of world leadership. The chapter goes about this task by addressing the classical questions of *ends* and *means*--in what senses are the ends and means of world leaders unique or extraordinary, as compared to those associated with the traditional practice of statecraft. While the question of means (i.e., leadership capabilities) has received considerable previous attention, the ends sought by world leaders remain underexamined. The chapter concludes by developing the argument that world leaders seek *surplus security* in the military-political sphere and, in the material sphere, extend to global scale the objective of *reproduction* of the essential elements of capitalist society. Before proceeding to these tasks, it is first necessary to address the basic matters of definition and conceptualization, as well as examine the relationship between leadership and power.

Leadership: Definition and Concept

Leadership is among those political science concepts that are central to the discipline's substantive concerns but are not amenable to concise conceptual, let alone operational, definition. As a concept, it has been developed with almost exclusive reference to *personal* leadership, in contexts ranging from small groups to national political systems. Until quite recently, the idea of a nation-state providing world leadership enjoyed little currency. Therefore, this overview will first survey more general treatments of leadership in order to see what can be usefully borrowed for application to a global context.

The *Oxford American Dictionary* offers multiple meanings of the verb "lead," several of which are relevant for our purposes: "1. to cause to go with oneself, to guide, especially by going in front . . . 2. to influence the actions or opinions of . . . 6. to be in first place or position, to be ahead; 7. to be the leader or head of, to be in control. . . ." One of the same dictionary's definitions of the noun "leader" adds a slightly different nuance: "one whose example is followed."

These ordinary language definitions, employing such terms as "cause," "influence," and "control," take us onto familiar, if unmastered, terrain. Several dimensions of leadership that are pertinent to the present endeavor can thus be distilled from these definitions. First, "to lead," in the sense of "to guide," suggests that leaders perform some task, service, or function for the group/society, i.e., provide a good that otherwise would not be provided as effectively, plentifully, or at all. Second, to lead by influencing the actions or opinions of others implies that leaders are able to alter the behavior of other members of the group (an interpretation that is close to the behavioral-interactional concept of power). Whether this influence is accomplished coercively, say by means of deterrence or compulsion, or in a consensual manner, via suasion for example, is a question to which we will return. A third dimension of leadership--to be in first place or position--simply means that the leader has won or is winning some form of competition. Statements that the United States or Japan is winning, or that Europe has fallen behind in the "technology race" are examples of this usage. World leaders usually fit this criterion, that is, they have "won" a variety of "competitions" (including technological). However, this meaning suggests a necessary condition of leadership--winning competitions as tantamount to amassing relevant capabilities-- rather than tapping some essential aspect of its actual performance or execution. Leadership as winning a race or competition does take us closer to a fourth dimension of leadership--providing an example or model for emulation. World leaders have served as models in the narrow sense of displaying the technical ingredients of competitive success, but also in broader, more qualitative ways as well (e.g., innovative political forms and practices, cultural patterns).

These terms--guide, exemplar, model, innovator, wielder of behavioral power--provide a skeletal description of leadership that can be extended to the global level of analysis. Although these or other terms similar in meaning are found often enough in the international relations, political economy, and world-system literatures, they do not derive from, nor have they been melded into, a single encompassing concept of world leadership. Indeed, with the notable recent exceptions of Modelski's long-cycle theory and hegemonic stability theory, world leadership is a virtually nonexistent concept. Paige's (1977) exhaustive survey of the literatures dealing with political leadership does not acknowledge that its subject is manifest at the global level. His examination of articles published in the *American Political Science Review* from 1906 to 1963 reveals that only seventeen titles contained the words "leader" or "leadership"; of these seventeen, only one (Berdahl 1944) is concerned with world leadership. Similarly, Paige's (1977, pp. A) survey of doctoral dissertations written in American universities from 1925 to 1975 found 250 that had some form of the base word "leader" in their titles, none of which pertained to world leadership.

Paige's lament that political leadership has been a subject of disciplinary neglect thus applies with even greater force to the topic of world leadership. Inattention to leadership is certainly a fair characterization of the more specialized field of international relations. Consider K.J. Holsti's (1970) article on, "National Role Conceptions in the Study of Foreign Policy," in which seventeen distinct roles that various kinds of states play in the international system are differentiated. Descriptions are given of "regional," "revolutionary," and "bloc" leaders, but none of Holsti's categories refers to leadership on a global scale.

Holsti's survey of the mainstream study of international relations through the 1960s reveals that, up to that point, the discipline did not regard the international political system as having a functionally differentiated leadership role. The emphasis in the 1950s and 1960s on the "high politics" of national security, bipolarity, and the Cold War no doubt diverted disciplinary attention from the "low politics" of the world economy (where many of the more visible leadership functions have been performed). The oil crisis of 1973-1974 and subsequent events and trends during the balance of the decade dissolved the distinction between "high" and "low" politics, and spurred the emergence of international political economy as a prominent subfield. These developments, coupled with the (seemingly) sudden deterioration of the United States' position in the world, began to generate analytical interest in the phenomenon of world leadership.[1] To a limited extent, the concept has entered the traditional, security-oriented mainstream. Knorr (1975, 24-26) introduced "patronal leadership" as an ideal type of concept, although he seems to use it more in a regional than global context. And Waltz (1979, ch. 9)--using the term "management" instead of "leadership"--departs from his otherwise horizontal orthodoxy by acknowledging the functional differentiation of a higher order role that entails management of several systemwide tasks.

These few examples do not vitiate the charge that world leadership remains an underdeveloped, nonsystematic concept in mainstream approaches to world politics. Consider, for example, the recent work by Ole Holsti and James Rosenau (1984), *American Leadership in World Affairs: Vietnam and the Breakdown of Consensus.* The book, which is concerned with changes in foreign policy attitudes among American elites in the post-Vietnam period, is more accurately described by its subtitle than by its title. Even though it contains much that is relevant to the recent domestic dynamics of what we call world leadership, the authors never offer an explicit definition of the term, instead simply taking it as a given of the postwar world. The closest they come to a definition reduces to the containment: ". . . leadership in opposition to Communist expansion," followed by a listing of policies aimed toward this end (Holsti and Rosenau 1984, 94-95).

Conceptual development of world leadership has taken place only in long-cycle theory, the theory of hegemonic leadership/stability and, indirectly and to a lesser extent, in Wallersteinian theory's approach to hegemony in the world economy. Before examining the articulation of the concept in these literatures, I will digress to try to smooth the sharp semantic differences that have arisen over the use of the terms "leadership" and "hegemony." Whereas it is not always possible or desirable to purge concepts of the normative connotations that are attached to them, there is no point in allowing semantic differences to obscure commonalities underlying otherwise divergent theoretical approaches.

Modelski (1982, 98; 1983a, 122) regards hegemony as a deviant form of leadership, characterized by pursuit of self (national)-interest, coercive dominance, and lack of legitimacy. Hence he contends that the term should be reserved to describe such situations, and should not be confused with leadership which, by contrast, is concerned with cosmopolitan/systemic interests and which is afforded some measure of legitimacy by other states. Knorr (1975, 25-26) draws a similar distinction, with leadership defined by reciprocity of gains between leader and followers and by the absence of coercion. In this view, leadership is definitely a positive force that results in generalized benefits (although it is, of course, prone to excess and abuse).

Wallerstein's (1980, ch. 2; 1982) conception of hegemony will be spelled out more fully below, so here I touch only upon how it relates to Modelski's distinction between hegemony and leadership. Wallerstein, in fact, never uses the term leadership and only hints that hegemony has some generally beneficial aspects. To be sure, whatever positive effect as he may associate with hegemony, they are secondary, epiphenomenal features that do not constitute its defining essence. Hegemonic power, because it is aimed at maximizing the hegemon's share of the global surplus, is broadly exploitative, by design asymmetrical in its systemic distribution of gains. Wallerstein's (1982, 11-12) normative perspective is succinctly expressed in his description of the foreign policy consequences of the decline of U.S. hegemony: "Its [U.S.] abilities to dictate to its allies . . . intimidate its foes, and overwhelm the weak are vastly impaired." For Wallerstein, coercive dominance is a fundamental ingredient of hegemony.

Acknowledging that appeals to etymological authority are not likely to resolve these disparate emphases, it is instructive to note that hegemony derives from the Greek *hegemonia--hegemon*, meaning guide or leader. A sampling of dictionary definitions of hegemony follows:

1. Leadership, especially by one country (*Oxford Guide to the English Language*)
2. Leadership, predominance, preponderance, especially the leadership or predominant authority of one state of a confederation or union over the others (*Oxford English Dictionary*)
3. Preponderant influence or authority, as of a government or state; leadership, dominance (*Webster's Third New International Dictionary*)

It is clear that leadership and hegemony, if not synonymous in standard usage, are nearly so. Observe also that leadership is not, by definition, inconsistent with dominance, predominance, or predominant authority.[2]

"Hegemonic leadership," the label preferred by adherents of the hegemonic stability thesis, denotes elements of both of the positions sketched above. Combined use of the two words apparently originated with Hirsch and Doyle (1977), for whom the phrase refers to a mix of cooperation and control (with control entailing some degree of coercive influence). For the purposes at hand, the balance between consensual cooperation and coercive control can be regarded as a variable feature of what we choose to label leadership, hegemony, or hegemonic leadership. (For ease of exposition, the abbreviation "H/L," standing for hegemonic leadership, will henceforth be used.) Although no operational thresholds are offered here, inordinate reliance on coercive, relative to cooperative, means violates our concept of leadership. If world leadership is to be construed as something more than simply the power politics of the strongest state, we must insist that it rest on cooperative, positive-sum foundations. Notwithstanding this cooperative emphasis, it is unrealistic to exclude from the definition of world leadership such terms as force, coercion, or control, lest we be left with a normative, perhaps utopian, concept devoid of empirical referents.

The reader may have noted that the terms of this discussion verge on the concept of power. In fact, it is not possible to proceed beyond this point without examining important similarities and differences in the concepts of leadership and power.

Leadership and Power

The relationship between leadership and power has been examined extensively in the literature on personal political leadership. Although closure on matters relating to power is as remote there as elsewhere in the discipline, there is much to inform our global approach. Burns' (1978, 12) view that leadership is a "special form of power" is borne out by examining the striking similarities in approaches to the two concepts.

Traditionally, political leadership has been treated as a "positional" phenomenon, i.e., identified with and deriving from the properties of superior position, either in formal organizations or informally stratified collectivities (Edinger 1975, 255). This conception is directly analogous to the venerable "capabilities/attributes" approach to the study of power in all forms of politics, not least world politics. All of the versions of H/L that we have so far mentioned similarly begin with the premise that H/L stems from a superior position in the world system, with that position viewed as a function of predominant shares of specific military-strategic and/or economic capabilities and attributes.

Just as political science in general has leavened static emphasis on power-as-capabilities with the behavioral view of power-as-influence (A has power over B to the extent that A can get B to do something B otherwise would not do), so too have leadership studies shifted from the positional to an interactional/behavioral approach (Edinger 1975; Hah and Bartol 1983). Both the discipline at large and the specialized subfield of leadership studies have foundered in attempts to operationalize power-as-influence. More important, there has been a generalized failure to merge the two approaches to power by solving the conversion" problem: how and when capabilities are converted or not converted into influence.

There is a third parallel in studies of leadership and power. Recent elaborations on the concept of power in world politics have focused on power as the ability to set the agenda, or rules of the game. "Relational" or "meta-power" (Baumgartner et al. 1975; Baumgartner and Burns 1975), "structural power" (Christensen 1977), and "power as control over events and outcomes" (Hart 1976) are all terms that describe this systemic dimension of power (which is not addressed by the static emphasis of power-as-capabilities or the dyadic perspective of power-as-influence). An analogous approach in the personal leadership literature is what the social psychologist John Hemphill calls "initiation of structure": "To lead is to engage in an act which initiates a structure in the interaction of others as part of the process of solving a mutual problem" (cited in Paige, 1977, 74). Similarly, Tucker (1981, 15) defines leadership in terms of its "directive function": "A leader is one who gives direction to a collective's activities." Mapheus Smith's definition of leaders as those who emit stimuli that are "responded to integratively by other people" (Gouldner 1950, 12-13) taps the same underlying leadership function. As will be argued subsequently, initiation of structure and provision of direction and integrative stimuli are crucial leadership activities in a (world) system lacking formal structure, i.e., in the absence of superordinate authority and with precious little in the way of institutions, norms, rules, or procedures.

These points of convergence in conceptual approaches to the study of leadership and power lend credence to Burns's view of leadership as a special form of power. But what is special about leadership that differentiates it from power? For Burns (1978, 19), the critical distinction is that, "Leadership unlike naked power-wielding, is . . . inseparable from followers' needs and goals." Congruence of the motives of leaders and led is thus a necessary condition for leadership that sets it apart conceptually from power, especially when the latter is conceived as coercive domination.

In addition to compelling us to think of "followership" as an integral aspect of leadership phenomena, this formulation directs our attention to the ability of would-be leaders to tap the "motive bases" of potential followers. Motive bases, in the context of world politics, can be regarded as goals, objectives or, more broadly, state interests, e.g., security and welfare. Given congruence of motive bases, a matter to which we shall return, the relevant question is what kinds of power can be translated into leadership?

Following French and Raven, Janda's (1972, 59) study of the relationship between power and leadership identifies five sources of power: *reward* power, based on one actor's perception that another has the power to mediate rewards; *coercive* power, based on the perception that another actor has the ability to mediate punishment; *legitimate* power, based on the perception that another actor has the right to prescribe behavior; *referent* power, based on one actor's identification with another; and, *expert* power, based on the perception that another actor has needed knowledge or expertise. Janda excludes reward, coercive, referent, and expert power as forms of leadership,leaving only legitimate power as its basis.[3]

On this point, the character of personal and world leadership diverge. Legitimate power, as used by Janda, is what we usually associate with the trappings of sovereignty--formally constituted authority. But there is no analog in world politics, a multiple-sovereignty system wherein no state is accorded legitimacy in the sense of having the *right* to prescribe behavior for other states. H/L is informal and unconstituted and, therefore, must rest on the other four sources of power. This circumstance does not obviate the possibility of an H/L state enjoying some measure of legitimacy but, rather, suggests that whatever legitimacy it may enjoy stems from different and likely more transitory sources.

We are still left with the question of what brings about congruence in the motive bases (or interests) of leaders and followers. The consensual, although broad, answer that emerges from leadership studies is that leadership is contextual: ". . . its emergence and development in a particular place at a particular time is influenced by the circumstances prevalent" (Hah and Bartol 1983, 118). The idea that context affects the motive bases of both leaders and followers, sometimes bringing them into congruence, is plausible but much too open-ended to provide operational guidance. Useful specificity is found, however, in Burns's (1978, 38) emphasis on conflict as a contextual factor favoring the emergence of leadership: "Leadership as conceptualized here is grounded in the seedbed of conflict." Here lies a significant, if yet to be developed, parallel to Modelski's argument that world leadership is forged in the crucible of global war.

To sum up, the principal approaches to power and leadership are largely isomorphic. Leadership as a species of power is differentiated from its genus by the necessary condition of congruence in leaders' and followers' goals and interests. World leadership, however, diverges from personal leadership in that it derives from different sources of power. The next section of the chapter will attempt to build the case for a distinct concept of H/L by focusing on the historically extraordinary means and ends typical of states in the H/L role.

The Extraordinary Ends and Means of H/L

One certain area of agreement among theories of H/L is that the role itself is extraordinary. The hegemonic stability approach (Kindleberger 1973, 1976, 1981; Hirsch and Doyle 1977) recognizes only two historical instances, nineteenth-century Great Britain and twentieth-century United States. Wallerstein (1982) adds seventeenth-century Netherlands to this set, and Modelski (1978) identifies five instances of world leadership (the above three, plus sixteenth-century Portugal and eighteenth-century Great Britain).

Begging here the important issue of how many replications there have actually been, the question is in what ways is the H/L role extraordinary? What sets apart the handful of states that are claimed to have occupied this role from the universe of ordinary states? This question can best be answered by focusing on the ends and means associated with the exercise of H/L. This section will first examine the means (attributes and capabilities) commanded by H/L states and then turn to the ends (interest, goals) that such states have pursued. If it can be demonstrated that H/L states have been extraordinary in these respects, then a case can be made for a separate theory, which departs from the traditional horizontal approach, to account for the H/L phenomenon.

A fundamental substantive premise underlying this effort is that the world system is comprised of military-political and economic subsystems, which operate according to partially autonomous, although substantially interdependent, logics. Schematically, the world political economy can be depicted as formed of overlapping political and economic spheres; the area of functional interdependence (overlap) exceeds either of the areas where each functions independently according to its autonomous, core logic.[4] Explicitly rejected is the assertion of Wallersteinian world-system theory that the operation of interstate politics is driven by the "deeper" logic of world capitalism.[5] Assignment of equal weight to politics and economics suggests that a state in the H/L role must coordinately manage what Boulding (1968) has termed "threat" and "exchange" systems. Accordingly, we will look at both political-military and economic ends and means.

H/L Attributes and Capabilities

The approaches to H/L considered herein are all "basic force models," which use "tangible measures of power resources--such as numbers of people, quality of weapons, or wealth--to predict outcomes of political contention" (Keohane 1984, 20). As is well known, the simplicity of basic force models (as forms of power-as-capabilities thinking) is deceptive, since they leave several crucial operational questions unanswered: Just which capabilities are necessary? In what magnitudes? Under what circumstances will the possessor of sufficient amounts of the relevant capabilities choose to use (not use) them? The latter question, which bears more on motivations and objectives, will be addressed in the following section; the first two are of immediate concern.

What amounts of which capabilities enable the exercise of H/L? It is widely agreed that a preponderant, unipolar distribution of capabilities is a necessary, although not sufficient, condition. There is also general agreement that the role requires a diversity of capabilities and resources. But "preponderance" and "diversity" provide imprecise operational guidance and, beyond these points of loose agreement, there is, with the exception of seapower in long-cycle research, very little by way of specificity.

Wallerstein's (1980, ch. 2; 1982) conception of hegemony, derived largely from the Dutch case, rests almost exclusively on economic foundations. Hegemony is a "momentary summit," when a state simultaneously enjoys superiority over other states in agroindustrial production, commerce, and finance. Hegemonic *superiority* consists of a situation in which "one power is truly *primus inter pares*; that is, one power can largely impose its rules and wishes . . ." (1982, 3). Wallerstein suggests that simply having the largest world share of a given power resource will not suffice, and restricts his definition to "instances where the margin or power differential is really great" (1982, 3).

An additional interesting feature of Wallerstein's version of hegemony is his hypothesis that superiorities in the productive, commercial, and financial realms are gained--and then lost--in that sequence; he also provides arguments as to why and how the sequence unfolds as hypothesized.[6] The sequencing argument gives his conceptualization a dynamic quality and also has broader substantive implication concerning the sources of hegemonic ascent and decline.

Military-political power plays an odd role in Wallerstein's scheme of things, at once historically important and theoretically unimportant. For instance, he attributes the downfall of Dutch hegemony to the rise of superior English and French military power rather than to forces emanating from world capitalism per se (1980, ch. 3). But military-political capabilities are not systematically integrated into his theoretical framework; when invoked, it is in an essentially ad hoc manner (Rapkin 1983).

The defining feature of the hegemonic stability literature is its emphasis on international economic order as a "public good," more likely to be "produced" when there is a preponderant hegemon, or "stabilizer," than during periods when power resources are dispersed more widely across the international system (Kindleberger 1973, 1976, 1981; Krasner 1976, 1982; Hirsch and Doyle 1977; Keohane 1980, 1982, 1984; Keohane and Nye 1977). With their object of explanation restricted to international *economic* order and its constituent elements (regimes), contributors to this line of research have focused primarily on economic capabilities. The only explicit formulation of economic capabilities, however, is offered by Keohane (1984, 32-34) who posits that H/L requires preponderant shares of four types of resources: control over/access to raw materials, control of major sources of capital, control of markets (interpreted as having large import markets), and competitive advantages in the production of highly valued goods.[7] Although the role of military power is by no means gainsaid in this literature, it is relegated to the status of a "background condition" for hegemony in the economic realm: "The sources of hegemony . . . include sufficient military power to deter or rebuff attempts to capture and close off important areas of the world political economy" (Keohane 1984, 40).

An important contribution has been a demonstration of the need to differentiate H/L capabilities by issue area. Keohane and Nye (1977) first pointed out the limitations of what they termed "overall structure explanations," i.e., "basic force models" built on a unitary, aggregated conception of H/L power implicitly assumed to be fungible across different issue areas. In subsequent work, Keohane (1980, 1982, 1984) has shown that explanations of outcomes in different regimes (oil, trade, money) require knowledge of the distribution of those capabilities germane to the operation of the specific regimes in question. An aggregated conception of H/L capabilities is too crude to provide much regime-specific explanatory power.

The need to differentiate H/L capabilities by issue area, however, does not obviate the concept of an overall H/L structure. In this sense, the hegemonic stability literature begs the questions of what capabilities in what amounts are necessary for the establishment and maintenance of H/L. Perhaps, because at most two cases are recognized (eighteenth-century Great Britain is suspect on some counts), hegemonic preponderance is simply presumed with little or no attention to inventorying the types and levels of requisite capabilities. Whereas this may be a reasonable procedure if one is conducting a case study of the United States in the postwar world economy, it does not contribute much to the comparative study of H/L. This, of course, is not a problem if one acknowledges only one or two cases of H/L. But it is difficult to figure how, in the absence of explicit criteria, other cases--say, seventeenth-century Netherlands--are eliminated from consideration.

The most comprehensive conceptualization of leadership capabilities, including what should be considered more broadly as attributes, is found in Modelski's theory of long cycles of world politics.[8] Modelski (1983b) provides an abstract treatment of what he terms "factors of world leadership" (used in the sense of inputs, as in the economic concept of factors of production):

1. A favorable geography, preferably insular
2. A cohesive, and open society
3. A lead economy

4. A politicostrategic organization of global reach

For Modelski (1983b),

> these were the factors most favorable to the successful performance of the role of world leadership, and furthermore, those making it most likely that the world power would conceive of the maintenance of global order as being in its own self-interest.

The importance of *insularity* stems from its historical provision of a margin (or surplus) of physical security above that enjoyed by continental states with land borders to defend, and from the access it affords to global transportation and communication networks. Another advantage of insular position has been its contribution to *societal stability, openness, and cohesiveness.* These characteristics have laid the "foundation for global action," have enabled pioneering of innovative political forms, and have thereby resulted in world leaders serving as models widely emulated by other societies. World leaders have also been *lead economies* (defined in terms of innovation and technological dynamism rather than absolute size), which generate sufficient economic surplus to finance global operations and which also serve as developmental models. In Modelski's (1983 b) terms,

> it was not just size, nor innovation merely for the sake of innovation but innovation linked to global reach and world trade, and innovation for the adaptive upgrading of the modern world system (through trade and an expanding division of labor, more rapid and efficient technologies of transport and improved communications) that shaped the role of the lead economies.

As suggested in the above passage, economic leadership is consistent with, in fact reinforces, development of the *politicostrategic organization for global reach*, ". . . a matter of organizing a system for keeping order at the global level in respect of overall security and global economic relations, but not in respect of all the national peculiarities of local administration" (1983b, 13).

While explicitly assigning equal explanatory weight to political-military and economic factors, the capability of global reach--specifically seapower and, more recently, air and space power--clearly is accorded pride of place in Modelski's theoretical framework. On the empirical side, development of operational measures of seapower (Modelski and Thompson, 1987) has been the centerpiece of efforts to test long-cycle theory (Rasler and Thompson 1983, 1985a, 1985b).[9] It is important to point out that seapower (as global reach) represents a functionally specific kind of capability that is particularly well-suited to the strategy and tasks of leadership. As such, it must be differentiated from military power in general and especially from the capabilities associated with the land-based "physical conquest and direct rule" strategies historically followed by continental powers. Failed bids for world leadership have invariably been predicated on this latter, more costly and less manageable, strategy (Thompson 1983a).

The above discussion highlights the difference between the capabilities of world leaders and those of "challengers" to their leadership. Surely, the challengers' capabilities have also been extraordinary; indeed, the appellation "great power" itself implies extraordinary capabilities. But the key insight of long-cycle theory is its differentiation of sea power as a form of capability particularly germane to world leadership. An important implication is that traditional aggregated measures of national power resources (based on size of population, military forces, GNP, etc.) do not tap the capabilities necessary for leadership. By such measures, challengers have definitely been extraordinary; yet, they have lacked the instruments to attain and exercise world leadership.

In sum, Modelski's formulation of H/L capabilities is more encompassing than either Wallerstein's or the hegemonic stability approach. The latter two offer a more substantively detailed account of the capabilities bearing upon H/L in the world economy; this emphasis is complemented nicely by Modelski's more extensive treatment of military-strategic capabilities. Furthermore, the attributes of insularity and political stability/cohesiveness serve more than merely descriptive or taxonomic purposes. They are also related integrally to the capabilities associated with global reach and economic leadership, and therefore help to infuse the concept of world leadership with substantive content.

It was asserted earlier that H/L states have been extraordinary in terms of the means they employ and the ends they seek. All three schools of thought examined here are in agreement that H/L capabilities have been historically extraordinary, although they obviously differ as to which capabilities are of greatest importance. However, even if we had reliable 500-year series showing all relevant H/L capabilities, the extraordinary nature of H/L states would still be an essentially quantitative question, i.e., a matter of degree, which entails drawing a line that is partly, but inherently, arbitrary to demarcate extraordinary from ordinary states. In contrast, the question of ends, or the goals of H/L, although less amenable to exact measurement, offers better prospects for establishing the extraordinary character of H/L precisely because it is a qualitative question involving differences in kind.

The Goals of H/L

What has motivated states to undertake the H/L role? What ends have they sought through the exercise of leadership? We can begin to answer these questions by examining the traditional foreign policy goals of ordinary states, contrasting these goals with those attributed to H/L states, and determining the manner and extent to which the latter differ from or exceed the former.

The classical "core" goals of the sovereign state are maintenance of territorial integrity, protection of population, and preservation of sovereignty (as decisional authority) itself. In earlier periods, the pursuit of wealth entered this picture instrumentally, insofar as filling the state coffers contributed to the state's sovereign power and, thus, also to its ability to finance attainment of the core goals. More recently, particularly in the last century, pursuit of wealth has become a core goal, now construed as the imperative of maintaining/improving the material welfare of the population. States also pursue less tangible goals (e.g., prestige), as well as a range of narrower, shorter-term objectives, but it is generally agreed that these are secondary to, or can be subsumed within, the core goals enumerated above.

Pursuit of core goals, then, is the conventional stuff of statecraft; and, clashes between and reconciliation of the conflicting core goals of different states are the conventional stuff of horizontal approaches to world politics. Core goals are equivalent to what Wolfers (1962, ch. 6) termed "possession goals." These he distinguished from "milieu goals," which pertain to "the shape of the environment in which the nation operates" (1962, 73). Herein lies a principal difference between the ends sought by ordinary and H/L states. All states may pursue milieu goals, but ordinary states can only hope to shape their environment to a limited extent, on the margins so to speak. They simply lack the capabilities to do more, and hence cannot afford to regularly divert scarce resources from pursuit of core goals to application to milieu goals. At best, ordinary states can affect their regional milieu in desired ways, or possibly influence the global environment in sharply delimited, episodic fashion.

In contrast, states possessing extraordinary capabilities, while never approaching omnipotence in this regard, have the potential to significantly shape their global environment on a sustained basis. H/L capabilities, as described above, provide *behavioral power* used to alter the immediate actions of others in that environment and, more important, enable *structural power* used to shape the agenda of international issues, the terms of interaction, and the distribution of resulting payoffs (Baumgartner et al. 1975; Baumgartner and Burns 1975; Christensen 1977). This distinction corresponds to Keohane and Nye's (1973, 117) distinction between

> . . . a process level, dealing with short-term behavior within a constant set of institutions, fundamental assumptions, and expectations, and a *structure* level, having to do with long-term political and economic determinants of the systemic incentives and constraints within which actors operate. (Emphasis added)

These two levels are, of course, not entirely discrete. The relationship between the two is well expressed in Baumgartner et al. (1975, 52), with conceptualization of relational control as

> . . . the mobilization of power resources to *manipulate* the matrix of rules, the conditions of interaction, and the distribution of resources which, among other things, define the power and control possibilities for the exercise of

> behavioral control. The ability to exercise relational control is a *meta-power* setting the limits of lower order power.

Baumgartner and associates do not reserve the metapower concept for exclusive reference to H/L situations. But their treatment of the creation of the Bretton Woods system, during and after World War II essentially recasts Gardner's (1969) history in more abstract language to provide a clear example of the exercise of structural (or meta) power in an H/L context (Baumgartner and Burns 1975, 143-154). Another historical account of the formation of the postwar international economic order, which is readily interpretable in structural power terms, is found in Maier (1978).

Structural power then should be regarded as a higher-order form of power available in principle and practice only to those few states that have commanded extraordinary capabilities. But we are yet to satisfactorily resolve the question of the purposes to which structural power is applied. Krasner (1978, 334), following Schurmann (1974), draws a distinction--between the *politics of interest* and the *politics of ideology*--that bears directly on this issue: interests involve *material* aims and the social and physical quality of life. Ideology is concerned with order, security, and justice--a vision of how the world should be ordered on a global basis. "Interests" describe what we earlier referred to as core or possession goals. Ideology, in this usage, describes a far more expansive and diffuse type of goal. Order-building, order-keeping, system maintenance, creation of global institutions, and provision of global infrastructure are phrases that have been used to particularize the goals sought by H/L states through the exercise of structural power. For ease of presentation, we will henceforth use the summary term order, taken to mean international peace and security, the enjoyment of territorial rights and political tenure, and the regulation of global economic relations.

If this assertion--that the construction and maintenance of global order is the overarching goal of H/L--is accepted, there is still another question to consider: Why do H/L states assume the costly and difficult tasks attendant to the provision of order? Waltz's (1979, 198) response to this question is worth quoting at some length (although, it should be noted, Waltz is not an adherent of any version of H/L theory):

> The greater the relative size of a unit the more it identifies its own interest with the interest of the system. . . . System-wide tasks are difficult to perform. Why do larger units shoulder them? Like others, they want their system to be orderly and peaceful, and they want common interests to be cared for. Unlike others, they can act to affect the conditions of their lives. Organizations seek to reduce uncertainties in their environment. Units having a large enough stake in the system will act for its sake, even though they pay unduly in doing so.

This, of course, is a statement of the public-goods reasoning upon which the hegemonic stability literature is based (see especially, Kindleberger 1973, 1976, 1981; Hirsch and Doyle 1977). Politically and economically preponderant states harvest large absolute benefits from the creation and maintenance of order; because of this "large stake" in order, they are argued to be willing to bear a disproportionate share of the responsibilities and costs attendant to its provision. It is also frequently argued that H/L states are willing to sacrifice tangible, short-term national interests to the longer-term, more diffuse systemic interest of order (e.g., the Marshall Plan, American tolerance in the 1950s of Japan's trade restrictions); see Krasner (1982).

The public-goods approach to H/L has recently been criticized on the grounds that important elements of what is claimed to be the public good of global order are not really "public" in nature. Conybeare (1984) argues that multilateral free-trade regimes (centerpieces of British and U.S. H/L orders) do not meet the defining criteria of a public good--nonexcludability and nonrivalry in consumption. Certain states can be excluded from the benefits of free-trade regimes and, as suggested by perennial trade conflict, the problem of distributing these benefits can assume a rival, zero-sum character. Russett (1985, 224) contends that the goods associated with the post-World War II order ". . . in many ways . . . represent private goods accruing as much to the United States as to others," especially if security-related goods are factored into the cost/benefit calculus. Moreover, he argues that the initial order-building costs borne by the United States ". . . were recouped many times over from the general prosperity stimulated by a relatively open world market, and specifically by American access to others' previously closed markets" (1985, 225).

There is considerable merit in these criticisms. The elements of global order are indeed mixed goods, exhibiting both private and public characteristics. Russett's calculation of the net security and economic gains reaped by the United States from its H/L order should serve as a welcome corrective to any lingering perceptions of complete U.S. self-abnegation.

Yet these criticisms do not invalidate the overall thrust of the public good approach. That the H/L state benefits significantly from the order it constructs is, after all, an initial premise of the public-goods argument, namely the "large stake." Demonstration of significant H/L gains is therefore not contrary evidence. That the H/L state's (private-national) interests converge with systemic interest is an anticipated part of the story, although Russett is probably correct in arguing that his convergence occurred sooner rather than later in the postwar saga.

The mixed (private and public) character of H/L order is brought into bold relief if we consider Modelski and Thompson's (see their chapter in this volume) application of exchange theory to the problem: that is, the H/L state produces the public good of order and distributes it to consuming states in exchange for loyalty, support, compliance, etc. But the H/L state is not only the principal producer of order; as implied by the "large stake," it is also the largest consumer of the good it produces.

Another way to think about the same problem is to compare a particular H/L order with the counterfactual alternative of no H/L order. (Note here, that for American and allied leaders at the end of World War II, the alternative was not counterfactual but, instead, consisted of the still quite real experience of the 1930s.) Russett mentions the "general prosperity stimulated by a relatively open world market." Would this general prosperity have occurred in the absence of American H/L, or was it actually a product of H/L order? If we choose the latter--and I think the weight of the evidence and analysts of most persuasions support this assessment--then we must consider the aggregate total of and the distribution of benefits (whether public or private) from this prosperity against the alternative of no prosperity. In the extreme, if H/L behavior pushes the global production frontier outwards and thereby raises the private-national welfare of all states in the system, does that behavior equate to provision of a public good? I would say yes, without pretending that this in any way resolves the problem.

All this is to emphasize the peculiar nature of the good in question and the inability of existing social science theories to neatly account for its production and consumption. In sum, there is still considerable analytical mileage left in the conception of H/L order as a public good, although this conception needs to be qualified in the ways suggested by the criticisms discussed above.

Reproduction and Surplus Security as H/L Goals

The idea of order as the primary goal of H/L can be developed further through the concepts of "reproduction" and "surplus security." These, it will be argued, are the major constituent elements of the H/L state's conception of order in the economic and political-military realms of the world system.

"Reproduction of the essential elements of capitalist society" is a central concept in structural Marxist theories of the capitalist state (Gold, Lo, and Wright, 1975; Block, 1977) that is reminiscent of the once-popular structural-functional approach to comparative politics and macrosociology. Structuralist approaches have been devised to improve upon the orthodox Marxist interpretation in which the state is viewed as the instrument of a cohesive capitalist class. In the face of visible cleavages among different segments of this class, and in view of frequent state policies that are demonstrably contrary to the interests of certain of these segments, structural Marxists reject the conception of state and capital as a single-minded, unitary actor. If capital is not homogeneous, i.e., if there are recurring clashes of interest among segments of capital, then the state cannot act in a manner consistent with the interests of all segments. Structural Marxists, instead, postulate a division of labor between capitalists and state managers:

> Those who accumulate capital are conscious of their interest as capitalists, but, in general, they are not conscious of what is necessary

> to reproduce the social order in changing circumstances. Those who manage the state apparatus, however, are forced to concern themselves to a greater degree with the reproduction of the social order because their continued power rests on the maintenance of political and economic order (Block 1977, 10).

Structuralist theories therefore focus on those functions the state must perform in order to reproduce the essential elements of capitalist society, *inter alia*, protection of property rights, provision of internal and external security, and ensuring an adequate supply of skilled, nonrevolutionary labor. Since capitalists are too absorbed in the short-term imperatives of accumulation to bring their energies to bear on these necessary functions, it is incumbent on the state to perform them in their mutual long-term interest.

Structural theories of the state are framed in an exclusively national context case and refer only to requisites of capitalist reproduction.[10] But the recent popularity of the reproduction concept in structural Marxist theory does not preclude its broader application to aspects of a society, other than the manner in which it organizes for production. I propose simply to extend the concept by arguing that H/L states attempt the formidable task of reproducing *global* order, including its political, as well as economic, components.

One could make the case that all social systems attempt, with variable results, to reproduce their essential political and economic features. The problem at the world-system level is that these efforts are aimed toward the reproduction of individual national societies. With the exception of one line of argument, there is little reason to assume that the sum of unit-level reproductive efforts is reproductive for the larger system that the units comprise. The partial exception is balance-of-power theory (Waltz 1979) that contends that the horizontal character of the interstate political system is "reproduced" as a by-product of the self-regarding behavior of its constituent state units.

This is a valuable argument that helps to account for why the interstate political system has not been transformed into empire; but, it connotes no more than a minimal conception of order that arises from the uncoordinated actions of state units. From the long-cycle standpoint, order is a substantively richer, more complex property that requires the conscious efforts of a world leader to create and reproduce.

Space does not permit detailed specification of the reproductive functions undertaken by world leadership. The argument is well illustrated, however, by the post-World War II U.S. case. Members of the wartime Roosevelt administration clearly viewed the international system of the 1930s as *nonreproductive*--as evidenced by the virtually total collapse represented by the Great Depression and World War II. Their efforts to erect the institutions, norms, and rules necessary for the functioning of global capitalism (e.g., GATT, IMF, IBRD) can be quite plausibly interpreted as efforts to ensure its future reproduction--see non-Marxist accounts that are consistent with this construction (Gardner 1969, Maier 1978). In the terminology of the discussion earlier in this essay, the United States used its preponderant capabilities for the exercise of structural power to shape its world environment so as to raise the probability of its continuation as a capitalist world. Whether or not the reproduction of capitalism is viewed as a public good hinges, of course, on one's normative valuations of capitalism. In any case, we can again invoke the "large stake" argument as sufficient motivation for these actions.

In the political-military realm, the major goal of H/L is the attainment of "surplus security," a concept with both simple and more complex meanings. As Modelski uses the concept, it refers to an extra margin of security (historically afforded in part by insular location) above that enjoyed by ordinary states. In this usage, surplus security is akin to Boulding's (1962, 59) concept of "unconditional viability":

> A party that cannot be absorbed or destroyed as an independent source of decisions is said to be *unconditionally viable.* A party that can be absorbed or destroyed by another is *conditionally viable* if the party that has the power to destroy it refrains from exercising this power.

Boulding further specifies two types of conditional viability. "Insecure" conditional viability refers to a situation wherein one party can be destroyed by another, but survives only because of the goodwill of the latter. "Secure" conditional viability refers to a situation wherein one party can be destroyed by another, but survives because it does not pay the latter to do so (i.e., mutual deterrence).

Insecure conditional viability has been the historical lot of most ordinary states; great powers, through their own devices and alliances, have generally achieved secure conditional viability. Unconditional viability has been the province, albeit fleeting, of H/L states. The United States enjoyed unconditional viability until the Soviet Union developed nuclear weapons and delivery systems capable of reaching the U.S. heartland. Since that time, both the United States and the Soviet Union have been in a position of secure conditional viability. But the United States, ever in the vanguard of military technology, has continued its quest for the surplus security of unconditional viability. (The attempted development of a space-based ballistic missile defense surely can be construed as a bid for unconditional viability.)

Another aspect of surplus security concerns protection of the H/L state's formal allies and regional spheres of interest. Insuring the security of Western Europe, Japan, and Israel, as well as containment of the Soviet Union at various other points around the globe, indicates that the security interests of the United States in its H/L role have been almost coterminous with the security of the wider system. The global reach capabilities necessary for surplus security in this sense verge on those necessary to maintain security on global scale--which is not meant to imply absolutely or universally. By way of contemporary example, the capabilities deemed necessary by the U.S. government for the balance of the century include the wherewithal to engage and defeat the Soviet Union in conventional wars in three theaters; "prevail" in a nuclear war; control outer space; and, escalate "horizontally" around the globe in response to lower-level Soviet provocations. This is familiar information to be sure, but the point is that these perceived security requirements exceed, by a wide margin, those needed to meet the core security objectives (protection of territory, population, and sovereignty). The margin of difference can be regarded as surplus security.

Andrews (1978) assigns a different meaning to surplus security, which usefully augments the two we have developed so far. He distinguishes surplus from "basic" security, with the latter term corresponding to what we have called core security goals; the requirements for basic security can be deduced from the strategic conditions prevailing in a state's geopolitical environment. Surplus security, on the other hand, involves an outward projection of an H/L state's "domestic paradigm," i.e., its values, ideology, and ordering principles.[11] In this formulation, surplus security "entails securing an external environment in which the constitutive and distinguishing features of the social order can be safeguarded and legitimated" (Andrews, 1978, 23). It depends on ". . . excluding certain international futures from the realm of possibility--futures which would not have jeopardized the more limited strategic requirements of basic security" (1978, 22). It is perhaps not too much of an oversimplification to use the phrase "making the world safe for democracy" as an illustration of this version of the surplus security concept.

We have attributed three different meanings to surplus security: an extra margin of physical security; a geopolitically extensive conception of security interests; and maintenance of an external environment in which the substantive content of the domestic social order can thrive. All three variants connote a type or degree of security that is beyond the means available to ordinary states; the latter two can be construed as forms of reproduction. Like reproduction, surplus security is a goal that only H/L states can afford to pursue.

Conclusion

This chapter has sought to integrate existing ideas from disparate sources in order to shed new light on the cognate concepts of leadership, hegemony, and hegemonic leadership. At a minimum, I hope to have demonstrated that (1) the phenomenon of H/L cannot be adequately comprehended within the classical, horizontal approach to international relations, and (2) that a separate or auxiliary theory that addresses the distinctive ends and means of H/L is therefore needed. The arguments to this effect do not need to be recounted or summarized here. Perhaps the best way to conclude is to point out what this chapter has *not* accomplished, and therefore to chart a direction for future research.

First, the chapter has been conceptual, unencumbered by the need for evidence. The discussion has been couched in general terms, but illustrated largely with references to the familiar twentieth-century U.S. case. The small number of historical instances of H/L dictates much greater attention to empirical comparison of similarities and differences among putative cases.

Second, although generally endorsing the conception of leadership developed in Modelski's long-cycle theory, the essay has skirted the question of why H/L should arise and decline in a cyclical manner. The answer to this question appears to lie somewhere in the relationships among power transitions, global wars, economic cycles, shifting valuations of order, and leadership itself. These factors join to form an analytical conundrum which, to date, has escaped the best efforts to deduce or induce a comprehensive, multivariate solution.

Third, the notion of cycles of leadership returns us to the question of N-size--how large is the universe of H/L? Depending upon whom one consults, N equals either one, two, three, or five. The reader may have noticed that many of the concepts and examples set forth in the essay are less persuasive the further back one goes in historical time. In application to sixteenth-century Portugal, for example, the ideas of reproduction and surplus security probably seem ludicrous.

Last, I suggest that the first three lacunae can best be addressed, and filled, by adopting an explicitly *evolutionary* theoretical perspective on the world system and its constitutive elements, including H/L. From this standpoint, the H/L role has evolved to encompass a successively greater variety of more complex functional activities. Consider Portugal, which clearly lacked the productive superiority of subsequent H/L cases and, in fact, existed in a world that was not yet capitalist (or for that matter, not yet integrated as a world system). Yet from an evolutionary perspective, Portugal should be regarded as an embryonic, partially realized instance of H/L in which (only) global reach capabilities and strategies--the hallmark of subsequent H/L states--were conceived and pioneered. Over time, as the world system has expanded in terms of size, number of state units, and interactional density, the demands of the leadership role have become cumulatively more numerous, costly, and functionally complex.

This process needs to be mapped, and the largely neglected evolutionary approach is the best available tool for doing so. But we will have to reorient ourselves epistemologically. Evolutionary systems are disequilibrium systems, i.e., they lack stable parameters and, therefore, also lack predictive power (Boulding, 1981). But, as suggested in the course of this essay, horizontal theories depicting the international system as a universe of states, in something resembling Brownian motion, offer still less predictive power with respect to certain world-system questions.

Finally, there is another epistemological problem inherent to the study of H/L: attempts to verify/falsify propositions about world leadership take us squarely into the realm of the counterfactual. As Edinger (1975, 259) puts it, "The basic theoretical question for an empirical investigation is whether it can be demonstrated that what happened did happen because supposed 'leaders' made it happen." Such a demonstration is fraught with counterfacticity and, hence, is a problematic undertaking within a positivist logic of verification. Edinger (1975, 263) suggests that we assess leadership "in terms of the magnitude of changes from antecedent patterns of behavior." If antecedent patterns of behavior in the world political economy are accurately described in horizontal terms, then the comparison of hypothesized instances of leadership against the extrapolation of horizontal expectations seems a promising way to proceed.

Notes

I would like to thank George Modelski, David Forsythe, and Louis Picard for their critical comments.

1. It is ironic, although not coincidental, that the idea of world leadership began to receive scholarly attention--at least in the United States--just at the time when the United States was becoming demonstrably less able to exercise it.

2. Indeed, as Kindleberger (1973, 307) notes, for some the term leadership refers primarily to these, rather than positively regarded, qualities: "Leadership is a word with negative connotations in the 1970s when participation in decision-making is regarded as more aesthetic. Much of the overtones of der Führer and il Duce remain."

3. The exclusion of any form of coercion from the conceptualization of leadership (Janda 1972; Burns 1978), carrying with it the implication that leadership rests wholly on voluntary compliance, is not uncontroversial

(Hah and Bartol 1983, 115). See Paige (1977) and Tucker (1981) for approaches that incorporate some measure of coercion as an allowable ingredient of leadership.

4. A third sphere, world culture, is not treated here. Both Modelski and Wallerstein acknowledge that the cultural sphere has been neglected and is in need of more analytical attention. For a brief, initial attempt, from a Gramscian perspective, to develop the concept of world cultural hegemony, see Russett (1985).

5. Rapkin (1983) provides a more detailed argument for the inadequacy of a single capitalist logic to a complete understanding of the world system.

6. For a rough test of the sequencing of capability erosion in the post-World War II period that provides qualified support for Wallerstein's hypothesis, see Rupert and Rapkin (1982).

7. Note that the latter three areas approximately correspond to Wallerstein's categories of financial, commercial, and productive superiority; "control over raw materials," a familiar Leninist category, is a needed addition to this set.

8. The seminal work in long-cycle theory is Modelski, (1978). His subsequent works (listed in the references) have elaborated the theory. Thompson's (1983) edited volume contains a variety of perspectives on the theory, as well as comparisons with Wallerstein's world-system theory.

9. Since I have suggested that others concerned with H/L have been lax in specifying requisite levels of H/L capabilities, a word on threshold levels of seapower is appropriate here. The operative rule of thumb in the long-cycle research program is that world leaders have at their disposal at least 50 percent of total global seapower. This criterion, although somewhat arbitrary, does have intuitive plausibility (more so in the context of military competition than, say, shares of world trade or reserves). Of greater significance, because it is explicit, it is subject to criticism and modification on substantive or technical grounds. The point is not that we need to, or can, arrive at empirical cutting points that are invariant through time and across issue areas. The crux of the issue is, instead, that empirical specification, even if initially conjectural and subsequently adjusted, is necessary for cumulative research progress and for development of predictive power.

10. Arrighi (1982) uses the reproduction concept with reference to the United States' postwar behavior in the world economy, although he does not develop it in the manner presented here.

11. Maier (1978, 24), whose primary objective ". . . is to suggest how the construction of the post-World War II Western economy under United States auspices can be related to the political and economic forces generated within American society," can again be invoked to illustrate concepts derived from other sources.

7

Daniel Pearson

The Global Economic Order of the Eighteenth Century

What is the relationship between the international political order and the global economic order? In the last ten years, social scientists have approached this question anew and developed several different interpretations. One such approach has come to be known as hegemonic stability theory. Charles Kindleberger (1973), Robert Keohane and Joseph Nye (1977), Stephen Krasner (1976), and Robert Gilpin (1975) have all contributed to the elaboration of this theory.[1] In its most basic form, their argument is that only with hegemonic leadership has the international economy been stable and liberal, and that no hegemonic leaders existed to order economic interactions prior to approximately 1820.

Hegemonic stability theory represents merely one collection of scholars out of a very wide variety that have recently looked at international political and economic order (albeit with varying degrees of intensity and focus). Probably the most widely cited of these other authors is Immanuel Wallerstein. Wallerstein begins his studies of the modern world in the "long" fifteenth century. He argues that it was at that time that a capitalist world economy based on an international division of labor and a global political system made up of autonomous, sovereign nations first came into being (1974a, 1974b). Further, he identifies three cases of hegemony: the Netherlands (seventeenth century), Great Britain (eighteenth and nineteenth centuries), and the United States (twentieth century). Among other writings by, for example, Fernand Braudel (1977, 1981, 1982, 1984) and George Modelski (1978, 1983), one is struck by the recurrence of the identification of 1500 as the approximate beginning of the modern world.[2] Of these writers, George Modelski is the only one to share a common focus with hegemonic stability theory in placing primary stress on the changing structure of power in the state system as being the most critical variable in explaining the ordering of global economic interactions in the modern world. It will be the first purpose of this chapter to briefly examine and compare the arguments and assumptions underlying the hegemonic stability theory and long-cycle theory.

The second purpose of this chapter is to serve as a test of the utility of the hegemonic stability theory in comparison to the long-cycle approach. As will be clarified below, both the hegemonic theorists and those working in long cycles share fundamentally similar methods of analysis. However, their identification of the beginning of the modern era is quite different, and serves to separate them in terms of which centuries can usefully be analyzed with these methods. The hegemonic stability group treats the rise of a *hegemon* and the creation of a liberal international economic order with its consequent degree of interdependence as the critical break point between the modern world and the past. Long cycles suggests that it is the creation of a global political system at the end of the fifteenth century that creates a single unit for analysis (Modelski 1978, 214). To hegemonic stability theorists, the eighteenth century is part of another world and, therefore, not subject to explanation on the same terms as is the world following the end of the Napoleonic wars. For the long-cycle approach, all the centuries since 1500 are subject to a similar dynamic and hence can be understood with a single set of analytical tools. An examination of the eighteenth century's global economic order, using the tools of hegemonic stability theory, should then be a fair test of the basic premises undergirding both long cycles and hegemonic stability approaches. If the post-Napoleonic world economy and state system are unique, as hegemonic stability theorists assert, then one would not expect their methods of analysis to be capable of shedding much light on the nature of the eighteenth century's international economy. But if those tools can be used effectively, then the basic premise of the hegemonic stability group is flawed, even if its analytical tools are found useful.

Before turning to these two purposes, it may be worthwhile to reflect on why hegemonic stability theorists themselves do not attempt to apply their general approach to earlier periods. Why is there such a divergence in the periods under consideration by hegemonic stability theorists and other scholars working in this general area of inquiry? I believe there are three reasons why hegemonic stability theorists have not examined earlier eras. First, they seem to share a common focus on the structure of a liberal international economic order. This is not surprising because we live under such an order and the problem of its maintenance has been a fixation for both policy makers and scholars. A liberal economic order has been the creature of just two centuries--the nineteenth and twentieth. As a result, it does not seem surprising that Charles Kindleberger, an economist, would choose to focus on these two periods alone and spend less time looking at earlier periods that appear to hold little relevance for the economic problems faced today.[3] A lesson that these scholars have derived from observing the last two centuries' economic orders is that, for a liberal international economic order to work smoothly and continue to survive in the face of any of a variety of challenges, there must be a single leader willing to bear the costs of maintaining that order (Kindleberger 1973). This observation may well be true, but it begs the question of whether other, nonliberal forms of global economic order might not also depend on a leader--although the responsibilities commensurate with leadership under an alternative form of order might be fundamentally different from those implied by that word's use among the hegemonic stability group.

This brings into focus a probable second reason behind the lack of attention to pre-nineteenth-century orders, that being the definition of the term "hegemon," meaning a state that enjoys a clearly dominant position in the international political system and uses this margin of political advantage to create an economic order designed to meet its own economic needs. Although I am persuaded that the idea that a single state takes the lead in creating and enforcing or maintaining a global economic order is a fundamentally accurate one and worth pursuing, I also believe the connotation of the term as used by the hegemonic stability theorists is too marked by the necessity for overwhelming degrees of superior power. For example, the United States still enjoys tremendous economic margins in gross terms over all the other economies of the world; its GNP in 1980 was twice that of Japan and almost equal to the combined figure for the EEC, yet Krasner (1982a, 30, 46-47) has argued that the United States has already slipped from its position as hegemonic leader.[4] How much power, this leads one to speculate, is necessary to qualify as a hegemon? The hegemonic stability theorists fail to clarify this issue.

Finally, I do not believe that it is purely coincidental that in the United States, at this point in history, a handful of scholars should begin to develop arguments around the notion of hegemonic leadership. I would even go so far as to say that the very connotations that surround their use of these terms are derived from the post-1941 experience of the United States in world affairs. No nation in modern history has been more explicitly concerned, or has more deeply ruminated over, its position, rights, and responsibilities as a world leader.[5] No single state, at least since the time of the Roman Empire, has been so obviously dominant in any measure of the economy or (until recently) the military that one could choose. These qualities have flavored the hegemonic stability group's definitions and blinded them to the possibility that states of earlier epochs, although they may have enjoyed less of a margin of advantage over others or lacked as clear or, if you prefer, as arrogant a view of their position in the world, may have been crucial in shaping and maintaining a given global economic order.

The Hegemonic Stability Theory and Long-Cycle Theory: A Brief Comparison

The fundamental assumption behind the hegemonic stability theory is that the distribution of power in the international state system determines the degree to which the world economy will be securely and liberally ordered. "A liberal international economy," as Robert Gilpin has written, "required a power to manage and stabilize the system (1975, 40)." When power has been relatively concentrated in a single state's hands, as with Great Britain from 1820 to 1879 or the United States for the twenty-five years following the conclusion of World War II, then the world economy has been well ordered, according to liberal precepts (Krasner 1976). When power has become diffused among several competing states, this liberal world economic order has tended to disintegrate into competing, autarkic national units. Without a hegemonic leader, the world economy cannot maintain a liberal character, but tends to move towards autarkic closure (Kindleberger 1973).

Hegemonic leaders must be the most politically powerful and possess the most efficient economy. "Both elements, hegemony and efficiency, are necessary" for a state to have the capacity and interest to step forward to establish a stable international market exchange mechanism (Gilpin 1980, 20; Keohane and Nye 1977, 44). In addition to possessing sufficient political and economic resources, a state must possess the will to accept the burdens of leadership. Charles Kindleberger argues that the depth and length of the Great Depression can be explained because the British, who had the will to accept the burdens of leadership, possessed insufficient resources to carry the role, and the Americans, although possessing sufficient capacity, were reluctant to accept the role of underwriter to the international economic system (1973, 28, 296-299).

Hegemonic leaders establish economic orders that serve their interests. The most efficient producers have the most to gain from an open world economy; hence, one finds hegemonic leaders in the nineteenth and twentieth centuries establishing and maintaining liberal international orders (Gilpin 1981, 20). But besides being designed to serve the hegemon's interests, these liberal orders have provided a secure environment for trade and investment for all nation-states to enjoy, whether they participate in enforcing the rules of the system or not. In this sense, the international economic order is also viewed as a public good, which others can take advantage of without either depleting it or contributing to the costs of its maintenance. Long-cycle theory, in contrast, argues that, ever since approximately 1500, successive leaders have ordered the world's political and economic systems. To the extent that lesser states can neither be coerced nor bribed into contributing to the maintenance of the international economic order, then the hegemonic leader bears their share of the burden of maintaining the system and, therefore, a disproportionate share of the costs.

Hegemonic stability theorists point to three reasons why hegemonic leaders tend to lose their leadership role over time.[6] The first reason, stressed by Charles Kindleberger, is because "leading countries . . . lose their energy, innovative capacity, [and] readiness to accept the sacrifices which responsibility calls for" (1977, 113). The main source of this debilitating process stems from the ravages the hegemonic leader suffers in the face of free-rider behavior by other states and the costs of attempting to bribe them into compliance.

A second reason for the decline of hegemonic leaders over time is offered by Robert Gilpin. He develops the idea that the processes of economic efficiency that began in the dominant power, and initially gave it an edge over others, lead to forces that spread growth to other countries, thereby reducing the power of the dominant state vis-à-vis the other states in the system. Gilpin focuses on the foreign investment practices of the dominant state's key economic actors (British finance capitalists in the nineteenth century and U.S. multinational corporations in the twentieth) which invest their funds in foreign economies that show a higher rate of return and thereby contribute to the creation of conditions of economic growth in competing and peripheral economies. This capital drain is a consequence of the investment opportunity provided by the hegemon's stable and liberal ordering of the world economy. Not only do leaders or dominant states have to absorb the costs of maintaining the international economic order, as Kindleberger stressed, but they are drained by the very economic creatures that their system defends and allows to flourish (1975, 44-78).

With Gilpin, we find that the process of decline from leadership appears to be ultimately inevitable because it results, in part, from the very economic processes the power's international economic order allowed to flourish. In the early stages of that economic order, the relationship between the international order created by a dominant power and its key economic actors is, Gilpin suggests, a symbiotic one; each gain advantages from the other--the economic actors enjoy the benefits of secure markets and enforced contracts, while the state enjoys enhanced wealth and power. But later, a point arrives when that order, and more especially the behavior of its economic actors, serves as a drain on the relative power of the dominant state.

Stephen Krasner offers a final reason hegemonic leaders tend to slip from their position. He suggests that one can observe an almost irrational commitment to traditional policies by hegemonic states. The creation of particular sets of relations and the adoption of certain general principles by the hegemonic state in its early years of leadership, tends to put in motion a variety of domestic political actors --the bureaucracy of the state and private interest groups, for example--that have developed a commitment to the maintenance of those relations or principles. These domestic political actors, in defending their commitments, tend to constrain the policy options that the hegemonic leader can consider (1978, 330-342). As a result, one does not observe the hegemonic leader rationally calculating and recalculating its interests and reshaping the international economic order accordingly. Instead, one finds the hegemonic state expending ever greater amounts of political capital and economic wealth in a vain attempt to maintain the shape of the structures that it erected when it had a much greater margin of superiority over others. These actions only speed up the process of decline that has already begun to unfold. The classic example of this process was Great Britain's continued pursuit of policies appropriate to a rising hegemon (the gold standard and free trade) long after this position had been passed. These policies or commitments, Krasner argues, will continue to be pursued unless some cataclysmic event shatters the hegemon's commitment to them (1976, 341). In Great Britain's case, this cataclysm--the Great Depression--occurred too late for Britain to recover its position as hegemon by pursuing dramatic new policy initiatives.[7]

The result of the costs of maintaining the international economic order, the inability of the hegemonic leader to consider policy alternatives as its structural position alters, and the steady flow of wealth from the hegemon's economy to peripheral economies--due to the activities of the hegemon's own dominant economic actors--leads to a shift in the structure of power in the state system against the hegemon, subsequent challenges from competing states, and, ultimately, the collapse of the international economic order.[8] This analysis led one reviewer to state that one of the central themes of these writers "is that liberal international economic systems have an inherent tendency to destroy their liberal character" (Sylvan 1981, 380-381).

This process of the rise and decline of hegemonic leaders has, these theorists suggest, occurred once previously with Great Britain in the nineteenth century and is now unfolding in the United States, which, they argue, has already slipped from its hegemonic leadership position (Krasner 1982a, 30; Kindleberger 1981, 248). Robert Gilpin has been the most explicit in suggesting that there is a general cyclical pattern in these successive rises and declines of hegemonic leaders. Gilpin proposes that each of the cycles is marked by four phases: equilibrium in the state system, redistribution of power, disequilibrium in the system, and resolution of systemic crises (Gilpin 1981).

Gilpin asserts that this general cyclical process has been repeated again and again over many centuries. And yet for Gilpin, as for the other hegemonic stability theorists, the nineteenth and twentieth centuries are unique; these were periods so dominated by a single state that no extensive continuities to prior international political processes can be marked. The nineteenth and twentieth centuries stand alone in having enjoyed a dynamic of leadership based on hegemony or extensive political, economic, and military advantage. With the exception of Gilpin, none of the hegemonic stability theorists have actually examined international political economic processes prior to 1820. Gilpin considers the seventeenth and eighteenth centuries to be a kind of transitional phase between the old global pattern of empire and the modern world (he defines the modern world as being marked by the rise of nation states as the principal international actors, the advent of sustained economic growth based on modern science and technology, and the emergence of a world market economy) (1981, 116). The seventeenth and eighteenth centuries were distinctive, Gilpin argues, because the states tended to balance one another off, whereas, in the nineteenth and twentieth centuries, one state had successively achieved preeminence over the other states in the system (1981, 170).

Long-cycle theory traces the origins of modern international political processes back to 1500, with the creation of a global political system. Since that time, each century has been marked by the rise of a state to the level of world power (or to world leadership). Portugal in the sixteenth century, the United Provinces of the Netherlands in the seventeenth century, Great Britain in the eighteenth and again in the nineteenth century, and the United States in this century have each filled the role of world leader (Modelski 1978, 214-217).

The essential insight underlying long-cycle theory is that one can identify a recurring pattern or cycle of change in the structure of the international political system. These cycles, which correspond to each period of world leadership, play themselves out in four phases. The initial stage is global war from which emerges a dominant victorious state that, in the second stage, assumes the role of world leadership. The world leader performs the function of ordering and maintaining global political and economic interactions. In the third phase, the increasing complexity of global interactions, and hence the increased costs of leadership, relatively weakens the lead state while, simultaneously, other states begin to assume new functions and increasing responsibilities. This phase has been labeled "delegitimation." The final phase, referred to as "deconcentration," is a period of intensified rivalry, competitive disruption of international interactions, and a general dispersion of power. This final phase leads, in turn, to a new global war as the cycle begins to replay itself (Modelski 1982, 97-100). Long-cycle theory connects changes in the structure of the international global system to changes in the provision of international order; as lead states have risen and declined in each cycle, so have the international orders which that state had established and attempted to maintain.

Each world power, Modelski argues, has functioned to construct the framework of the world economy (1981, 71). The provision of these arrangements is simply one of the many areas of world interaction (also providing, for example, security, diplomatic, and communications interaction leadership), which a lead state takes the initiative in organizing. Clearly, world powers have derived economic advantages from the ways in which they have shaped international political economic relations, but they have also provided a measure of security and stability for all and, therefore, their actions have served the common good (1981, 70-71; 1982, 98).

Each cycle in the global political system has also demonstrated a tendency toward the introduction of innovations and for developing connections of increasing complexity compared to prior cycles (1982, 100-102). In the regulation of intercontinental trade, one finds that the early world powers used fairly crude devices, but that these devices have become increasingly complex. Portugal banned market access to its worldwide ports and trading centers, except for those with specific permission. The Netherlands formed two large trading companies with monopolistic trading privileges--a pattern the English copied in the eighteenth century for their own purposes. In the nineteenth and twentieth centuries, we have found Great Britain, followed by the United States, developing an increasingly complex set of trade and tariff rules, currency convertibility and stabilization processes, credit regulations, and investment guidelines (1981, 71).

Although this is simply a brief overview of long-cycle theory, it does point to some obvious similarities between the tools of analysis of long-cycle theory and those of the hegemonic stability theory. Both begin by arguing that changes in the structure of the international state or political system lead to changes in the ordering of global interactions. Both share a common focus on the important role lead states have assumed in ordering global economic relations. Finally, both Modelski and Gilpin have developed quite similar conceptions of a cyclical process of international political change.

Although these commonalities are significant, the dissimilarities between the two theories are more interesting. Two areas of disagreement seem especially important. The first difference I would point to stems from Modelski's observation that the modern world system (in both its political and economic components) has become increasingly complex over time. None of the hegemonic stability theorists, including the more historically sensitive Robert Gilpin, seems to explore this possibility for any era prior to 1820. Since that date, hegemonic stability theorists have noted a process of increasing systemic complexity, and Keohane and Nye argue that we have moved into an age of complex interdependence (Keohane and Nye 1977). The implications of relating the concept of an ever higher complexity and security (or stability) of international interactions is that one might find the requirements or challenges for a world leader to fulfill will change over time.

The final, and perhaps the most significant distinction between these two theories, which I alluded to above, stems from their very different periodizations. In answer to the question of where one places the critical breakpoint that marks the modern world, the hegemonic stability theorists seem to answer that it is with the creation of a liberal world market system dominated by hegemonic powers. Faced with the same question, long-cycle theorists argue that it was the creation of the international political system around 1500. Which answer is more persuasive? This will be tested by examining Great Britain's position in the global economy of the eighteenth century to determine to what degree one can discern an "order," and I will conclude by seeing how useful the tools of hegemonic stability theory are in analyzing the period.

Great Britain and the Global Economic Order of the Eighteenth Century

Ever since Adam Smith's *The Wealth of Nations* was published in 1776, people have characterized the international economy of the eighteenth century as being a mercantile system. But what does this mean? Scholars have generally written about mercantilism by focusing on the nature of the state's control of the national economy to enhance the king's wealth and, hence, his power.[9] Mercantilism, as a foreign economic policy, is usually examined in terms of its impact on the external commercial relations of a given state and the impact of these regulations on its economic performance. This approach is fine as far as it goes, but I believe it fails to give adequate treatment to the results of these policies in the world economy. It is not enough to examine the why, the how, and the impact of mercantilism on the performance of a given political-economic unit, but one must give equal weight to examining what impact these policies had on the rest of the world, for mercantilism provided the principles that organized eighteenth-century world trade.

Clearly, Britain was not the only state to apply a mercantilist approach to foreign economic policy in the eighteenth century. Peter the Great's Russia adopted this approach as did, more importantly, France under Louis XIV (Jones 1980, 56-77). But, although France was the dominant power on the continent of Europe, it was Britain's application of mercantilism in its efforts to regulate foreign that both set the pace for other European powers and provided the organizing principles for world trade. It was Great Britain and no other--not the declining Spanish or Portuguese and not the Dutch whom the British had displaced--that established a framework for global economic order in the eighteenth century and defended it with its superior navy.

One can trace Great Britain's consideration of a mercantilist foreign economic policy back to the bullion crisis of the 1620s (a crisis brought on by reduced Spanish returns from the New World and the resulting decline of Spanish imports of European goods, which brought on a disastrous drop in exports for England as well as a general European recession) when English merchants began to pressure the state for relief from the efforts of their Dutch rivals who, because of greater skill and business acumen, were able to maintain and even expand their trading levels largely at the expense of the English (Jones 54-55). The Netherlands served as the entrepot for world trade in the seventeenth century; Amsterdam was the nexus at which the trade of the Atlantic, the Baltic, central Europe, and the East Indies all converged, intermingled, and was subsequently transshipped (Wilson 1965, 53-57). This attitude of the English merchants, who looked across the Channel with anger and jealousy at the flourishing Dutch, was matched by the Crown's dissatisfaction with the decline in state revenues. The economic policies that emerged during the next thirty years, culminating in the First Navigation Act in 1651, revealed this blending of interests between the state and the merchants, and the shared "conviction . . . that England's economic problems reflected her unsatisfactory relationship with the leading power of the day, the Dutch Republic" (Wilson 1965, 41, 57).

As Europe endured a general recessionary period (even as the Dutch continued to increase their relative trading position), it was argued in England that the country could only enhance its national wealth by seizing a larger share of world trade (Jones 1980, 55). Underlying this kind of argument was a "static conception of economic life"; it was believed "that there was a fixed quantity of economic resources in the world which could be increased in one country only at the expense of another (Heckscher 1955 2: 24)." The best way for England to increase its wealth was to rob its neighbors--especially the Dutch--of their possessions. England sought to increase its share of world trade in the seventeenth century through two principal means: trade controls and warfare.

Trade Controls

In 1651, the first Navigation Act was adopted. Its most important requirements were that goods imported into England must come directly from the country that produced them and that these goods be carried in English ships or ships of the country of origin. Both of these requirements were aimed at weakening the Dutch. The first aspect sought to evade the Dutch entrepot and damage Dutch merchants, the second aspect was designed to simultaneously weaken Dutch shipping and strengthen England's (Wilson 1965, 62-63).

With the Restoration came a renunciation of all Protectorate legislation, including its economic regulations and the Navigation Act. But just as soon as this act of political purification was completed, the Crown set about reconstructing the mechanisms of economic control. In 1660, a new Navigation Act was established, which essentially reaffirmed the principles of the first act but included more effective enforcement measures. In 1663, the Staple Act (officially labeled "The Act for the Encouragement of Trade") was adopted, "which bound the colonists to buy nearly all the European goods they needed in England, and carry them in English-owned and English-manned ships" (Wilson 164; Fieldhouse 1965, 66). Subsequent acts limited the kinds of manufactures colonists could produce in an effort to create a market for English goods.[10] The legislation of the first three years after the restoration, as Charles Wilson has written, "laid the foundation of the system by which British overseas trade would be regulated for the next one and one-half centuries" (1965, 164). The aim of these policies was to force a large volume of English overseas trade to travel in English ships and pass through England. England attempted to erect an entrepot system, centered around

London, "by legislative compulsion backed by naval force" (Wilson 1965, 164). England desired to create by will and force of arms what the Dutch had primarily achieved through sound spontaneous business policies (although they too had enjoyed strong naval backing).

Warfare

England engaged in three wars against the Dutch in the seventeenth century: 1652-1654, 1665-1667, 1672-1674. Each of these wars was initiated by England and fought primarily for commercial advantage, and the campaigns were global in scope. For example, these wars were fought in African posts, the Caribbean, the East Indies, and, in the second war, the English seized New Amsterdam, the sole Dutch outpost in North America. In addition, each of these three wars ended in an inconclusive fashion or as very marginal victories for England, although England did succeed in closing off Dutch access to its American colonies and thereby enforced its exclusive trade and shipping claims. Warfare was generally not a directly effective method for England to improve its commercial position. But in combination with its trade policies and as proof of England's depth of commitment to enforce mercantilist principles (as in the America's), warfare was very effective.

Additionally, and perhaps most importantly, the financial and material pressures on the United Provinces to establish and maintain a navy sufficient to stave off the English, while simultaneously having to fight land campaigns against Louis XIV, placed too great a financial strain on the Dutch Republic, which, as a state, was merely a loose federation of provinces and lacked the kind of central economic control that this era of "institutionalized war" required (Wallerstein 1980, 75-81, 116; Wilson 1965, 65). So, indirectly, warfare greatly weakened the Dutch world position. Britain successfully used its superior strategic position and enhanced access to non-European areas of the world to first challenge, then subvert, and finally to replace the world economic position of the Dutch.[11] By 1680, England began to identify France as its major rival (and the French began to see England as their main opponent) (Wallerstein 1980, 275). By the early eighteenth century, it was clear that the Dutch Republic was no longer a power of the first rank and had been displaced from its position as a world entrepot and major trading nation by the English (North 1973, 146).

Although the policies that Britain used in the eighteenth century to order world trade were established in the second half of the seventeenth century, it wasn't until the end of the wars against Louis XIV (1713) that the British succeeded in regularizing international exchange. The defeat of Louis' plans for control of Spain and the continent, as a result of the collaborative efforts of Britain, Portugal, Spain, Austria, Prussia, the Netherlands, Savoy, and the Hapsburg Empire, ensured that France would not control Western Europe and allowed England to begin to establish more regularized world economic relations without a challenge from the French (Jones 1980, 177).

Great Britain now enjoyed colonial and maritime supremacy over every other state. The Dutch had accepted a position of uneasy maritime dependence on the British because, during the wars against Louis, the Dutch navy had been relatively neglected as the United Provinces poured most of their resources into raising and maintaining an army able to face the French. The Dutch had depended upon Britain to defeat France on the high seas, and Britain had poured its resources into the building of an even larger navy (Hill 1914, 218-213). This division of labor during twenty years of warfare placed the Dutch in a permanently inferior position at sea to the British. Additionally, Dutch financiers became key backers of both the British government and English entrepreneurs (Wilson, 1941: 197-201). The Dutch moved from a position of open hostility towards Great Britain in the years 1651-1680 to a position of relative dependence by 1713.

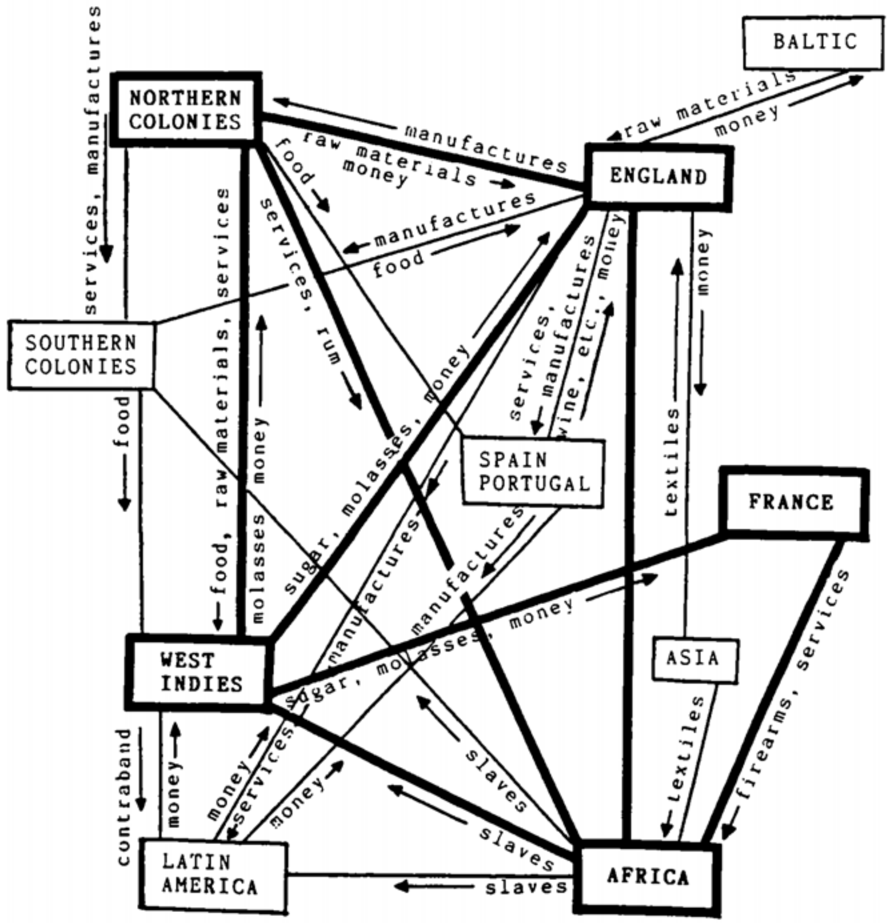
Portugal was also placed in a position of relative dependence on Britain for protection from Spain and France, and, as a result, granted significant trading concessions to English merchants in both the Portuguese and Brazilian markets in the Methuen treaties of 1703 and 1713 (Francis 1966, 184). Spain was already long past its zenith. For example, in preparing to defend Spanish ports from anticipated French raids in 1698, it was realized that Spain only had two warships that were seaworthy. Of the thirteen warships Spain used in Italy in 1698, seven were leased from Genoa (Hill 1914, 255). The French, at least in the years immediately following the end of the wars against Louis XIV, were too concerned with further enhancing their national unity and with securing their position on the continent to pose a serious challenge to Britain's colonial or maritime activities.

Britain's mercantilist policies provided the structure of international exchange. Mercantilist policies may be designed to add to the power or grandeur of the state pursuing them, but Britain's position as the new major world entrepot led to the creation of regularized sets of economic relations. Britain shaped and maintained a global economic order, and this order, although based on mercantilist precepts, required a state willing to expend the resources necessary to ensure that that order was not to be decimated by the challenges of other states (just as with a liberal international order). Its policies helped order and integrate markets in India (for spices and indigo), Africa (slaves for the tropics), the West Indies (sugar, rum and molasses), and North America (for furs, naval stores, raw cotton and, increasingly over the century, as a market for British manufactures) (Andrews 1915, 546).

Atlantic trade was especially critical to Britain's wealth and power. By closing its colonial markets to all but British and British-approved goods, and forcing those goods to pass through Great Britain before being shipped to the colonies on British ships, the British were able to control a large proportion of world trade and to enhance their own wealth. Slaves from Africa were shipped to the West Indies and the southeastern colonies in North America to work on the sugar and cotton plantations. The West Indies were essentially transformed into monoculture economies dependent upon the provision of food staples from North America and slaves from Africa. Britain, in turn, gained (as the above list must indicate) several essential raw materials that were used in its most important industries (textiles and shipbuilding), as well as possessing controlled and growing markets for its manufactured goods in North America. Figure 7.1 graphically demonstrates the interconnected nature of world trade in the eighteenth century and Britain's key position in integrating these markets.[12]

In addition to an elaborate set of economic relations with its colonial holdings, Britain was more successful in insinuating itself into the closed colonial markets of other

Figure 7.1 Multilateral Trade in the Eighteenth Century


BALTIC
NORTHERN COLONIES
ENGLAND
SOUTHERN COLONIES
SPAIN PORTUGAL
FRANCE
WEST INDIES
ASIA
LATIN AMERICA
AFRICA
services, manufactures
manufactures
raw materials
money
raw materials
money
food
services, rum
manufactures
food
food, raw materials, services
money
molasses
food
services, manufactures
wine, etc., money
money
textiles
sugar, molasses, money
manufactures
manufactures
manufactures
sugar, molasses, money
firearms, services
textiles
slaves
slaves
slaves
contraband
money
money
services
money

LEGEND:
- . Manufactures: especially textiles, not necessarily self-produced or consumed
- . Food: including tobacco and fish
- . Services: especially shipping
- . Money: in coin, bullion, and drafts
- . Raw materials: especially timber and other naval stores, and iron (from Baltic)

Source: adapted from Frank (1978, 221)

European powers than any other state. British merchants were able to trade extensively with Spanish America (especially with the signing of the Asiento Treaty between England and Spain in 1713), as well as with the remaining Dutch holdings in the East Indies, and, as previously mentioned, enjoyed a singularly advantageous trading relationship with Portugal and access to Brazil.[13] No other power held as elaborate or important a set of colonial markets or trade concessions as did the British (Wallerstein 1980, 269-280).

This elaborate system of colonial holdings and world trade was secured by the British navy. Before the last of the conflicts with Louis XIV, the War of the Spanish Succession (1701-1713), Mahan has written, "England was one of the sea powers; after it she was *the* sea power, without any second" (Mahan 1894, 225). Although comparative numbers on the strengths of the European fleets are surprisingly difficult to uncover, it is clear that during the War of the Spanish Succession, the Dutch could barely keep fifty warships at sea while, in 1721, Britain could boast of 122 ships of the line. By 1783, Britain had 125 ships of the line while the French, in 1780, possessed only eighty-five ships of the line and Spain not quite that many (Horn 1967, 99; Modelski and Thompson, 1987). In addition to defending Britain's colonial holdings, the navy's major task was twofold: (1) to defend British shipping from piracy, and (2) to stop the "free-traders" of the eighteenth century--smugglers. The second role was essentially one of enforcing the principles embodied in the Navigation Acts. But the first task was important because it ensured that coastal colonial holdings would not be devastated by piratical raids; it kept other European states from weakening the British through piracy during wartime and, most significantly, it provided a sense of security and certainty for the entrepreneurial activities designed to develop and exploit these new markets. In clearing the seas of smugglers (although this was never a perfect science) the British were enforcing their world economic order based on the principles of regulating and taxing trade and encouraging and controlling the use of English shipping. In clearing the seas of pirates, the British were not only providing a secure atmosphere for their own economic gain, but were providing stability and security for all shipping and export/import-oriented merchants or producers regardless of their nationality.[14]

Great Britain, by emphasizing international trade as the root of its wealth and power, acquired an elaborate set of colonial holdings and unique trade concessions, it developed the most extensive merchant fleet in the world (although the Dutch were still a close second through the first fifty years of the eighteenth century), and built a powerful naval force. It succeeded in providing the dominant ordering principles of the age, and used its power to defend those principles. But Britain's global position did not go unchallenged. The primary source of this challenge came from France which, beginning in 1756, began to directly attack Britain's world position by attempting to limit its continental role, as well as weakening and displacing it in non-European areas.

The war between France and Britain that began in 1756 was fought for influence in India and, more importantly, for control of North America. Britain's victory in 1763 was a successful defense of the political and economic order it had created, while materially expanding its influence into other's colonies (most importantly by seizing French Canada and forcing the Spanish to cede Florida). In the seventeenth century, war had been used by the British to help destroy Dutch economic advantages and to establish Britain as the primary European commercial power. In the first half of the eighteenth century, war was used by the British to maintain the political balance of the European continent. In the second half of the century, wars of balance were matched by wars used to defend Britain's economic position and the superior advantages it enjoyed as a result of the global economic order it dominated.[15]

The victory of the British in the Seven Years War did not end the challenges to the global economic order they created. Indeed, that order, and the mercantilist policies behind it, was fundamentally challenged and ultimately destroyed by the concatenated impact of the loss of the American colonies in the American Revolutionary War, the twenty-five years of European continental economic closure resulting from conflict with France, and the shifting interests of domestic political and economic elites.

The American Revolution was a direct threat to the viability of Britain's Atlantic system of trade. King George's greatest fear was that if England allowed the colonists to win, Ireland, and then the West Indies, would also pull away from Britain in part, at least, out of a desire to maintain their trading connections with the American ex-colonies (Fry 1970, 248). With the American victory, and the subsequent unstable economic relations with Britain, the heart of the British mercantilistic world was ripped out. The King's nightmare of falling colonial dominoes was not realized, but the loss of control over the "bread colonies" deeply wounded Britain's position, and consequently, its global economic order appeared to be in decline. The loss of the American colonies was not critical because trade stopped, for in fact trade continued; it was critical because the restrictions and controls that had integrated the American colonies into the closed and interdependent colonial system were destroyed. The fact that their greatest enemy, the French, had aided the Americans only made this situation a more bitter potion to swallow.

The second circumstance that undermined Britain's world order was the continual conflict after 1789 with the French Republic and Napoleon's empire. The unending political and military upheavals on the continent, over a twenty-five year period, severely disrupted British economic ties with Europe. Both France and Great Britain attempted to use economic means to weaken each other; the British used their navy to make sure that no imports from any source could enter French ports and they seized French, and even neutrals', ships. The British simultaneously seized the last French overseas holdings and forced the remaining Dutch and Spanish colonial markets open to all British shipping. The French, in turn, shut off Europe as best they could to British goods with the establishment of the Continental System in 1806 (Heckscher 1922, 9).

For twenty-five years, the economies of Europe, and especially that of France, were forced to turn in upon themselves, cut off as they were from the technological innovations of a rapidly industrializing Britain, and decimated by ongoing campaigns (Landes 1972, 142-146; Jones 1980, 9-10). Even as the economies of the European states stagnated, Britain was able to further diversify its own economy and, because of its naval supremacy, was placed in the position of being the sole European power able to have easy and assured access to all the non-European markets of the world. Britain, by destroying French overseas holdings and by engaging in campaigns of colonial conquest, "achieved a virtual monopoly on extra-European commerce" (Jones 1980, 262). Because of the reduced access to European markets that Britain experienced, these non-European markets became significant outlets for British exports. In 1772-1773, European markets received 49 percent of British exports and Asia, Africa, and the Americas 51 percent. By 1797-1798, Europe imported only 30 percent of all British exports, while North America alone received 32 percent and Africa and Asia accounted for the remaining 37 percent (Frank 1978, 217).

How then did this result in the destruction of Britain's global economic order? The primary reason was that it changed the constellation of mercantile-industrial interests in the British political arena. The outcome of the American Revolution had undermined the commitment of many British merchants and manufacturers to mercantilist policies. With this critical tear in the web of the Atlantic trading system, the rationale for mercantilist policies was damaged. With the coming of the French Revolution in 1789 (a mere six years after the end of the American Revolution), the subsequent opening of hostilities in 1793, and the resulting economic warfare, mercantilist policies regained some of their luster and justification. But by the time of Waterloo, and the end of hostilities, the industries and shipping of Britain were so clearly dominant over their continental rivals that there were strong political pressures in Britain to adopt freer trade measures and reap the advantages that would stem from access to an even larger market area.[16]

In 1713, the British had been the dominant power, but did not enjoy the degree of advantage over others that they came to enjoy in 1815. The result was that, in the eighteenth century, they sought to use government backing of merchant activity, coupled with the strongest naval force and an efficient system of administrative monitoring of domestic imports, exports, and control of the colonies, to successfully exclude competing states from British and colonial markets, while simultaneously forcing or cajoling their way into the markets and colonies of their main European competitors: Spain, Portugal, the Netherlands, and France's colonial holdings.

The efforts won important, privileged markets for Britain, especially for its manufacturers. This, when coupled with the government's protection of domestic producers, allowed conditions to develop that aided in the creation of the industrial revolution. The irony of the British mercantilist order is that it created conditions for steady economic growth in Britain and, consequently, political pressures from those very groups allowed to flourish by mercantilist foreign economic policy to depart from those principles. The global economy they maintained had given Britain's domestic economy an edge which, among a variety of other social and economic changes, enhanced the performance of Britain's economy relative to other European states and contributed to the beginnings of the industrial revolution. But though Britain's mercantile system was already destroyed (or was it abandoned?), Britain was able to maintain its dominant political and economic position. As a result, Britain was in a position to rearrange the world economic order in the nineteenth century to be based on free-trade principles. The global economic order of the eighteenth century came to an end, but the British were able to escape sharing the fate of the system they had established.

Conclusion

Gilpin, it was noted above, has argued that power in the international state system was more unevenly distributed in the nineteenth and twentieth centuries than before. The position of hegemons has allowed them to create a degree of integration and liberality in the global economy that had not existed when power was more evenly distributed. But having a state system in which the power distribution was relatively equal, as it was in the eighteenth century, is not to say that it was absolutely equal. For example, France, because of its greater population and highly centralized government system, was capable of raising and maintaining the most powerful army on the continent, and remained the dominant power in European relations throughout the eighteenth century (Horn 1967, 1-2). Britain, in contrast, enjoyed advantages in critical military and economic areas: access to the seas, superior naval forces, important colonial markets, and manufacturing innovations. This "balance of power" reflects a very different distribution of capabilities that gave Britain an advantageous position for functioning as a world leader in ordering global economic relations.

Great Britain (England) began acting to capture control of world trade in the seventeenth century, erected an elaborate global trading network in the eighteenth century, and used its navy to enforce its trading relations and principles in the face of challenges from competing states and nonstate actors (smugglers and pirates). This integrated trading system broke down as a result of the success of the American Revolution and the efforts by Napoleon to keep British goods out of Europe. The movement from a relatively integrated world market system, organized according to non-liberal principles, to a more fragmented one (France and Europe on the one hand, and Britain and the rest of the world on the other) parallels the process that hegemonic stability theorists argue occurs as the hegemon slips and its economic order breaks down into autarkic closure.

Clearly, Britain's eighteenth-century order suffered from a similar kind of decline, as did the liberal economic orders of the nineteenth and twentieth centuries. An interesting question is why Britain was capable of maintaining or recovering its dominant position while its economic order came to an end? Neither Great Britain, in the beginning of the twentieth century, nor the United States, if one believes Kindleberger and Krasner's gloomy assessments, have been able to pull off this trick. How did eighteenth-century Britain do it?

I have already hinted at a tentative explanation in my interpretive history. It was that mercantilist policies and Britain's dominant position in world trade created conditions that contributed to the successful beginning of the Industrial Revolution and the subsequent rise of merchant and manufacturing interest groups that turned against policies of exclusion and protection and pressed for free trade. Braudel argues that the moment of its loss of the American colonies --an apparent defeat--coincided with its rise to clear economic superiority, a superiority derived from its burgeoning industrial production. When coupled with the isolation, relative economic decline, and ultimate wartime defeat of its major rival, France, conditions were created for Britain's continued leadership, as well as a newly won hegemony.

Krasner's arguments about interest groups, ideology as a limitation on state policies, and the need for a cataclysm for an established set of ordering principles to be shattered and new policies to be considered and adopted shed more light on this situation. The defeat of mercantilist policies, which was represented by the victory of the American colonies, was an event cataclysmic enough to begin to shatter the ideological dominance of mercantilist thought. By the time of Waterloo, after twenty-five years of war and market disruptions, the ideology of mercantilism had been sufficiently undermined so as to give the state some degree of flexibility on policy, given the changed circumstances of world politics and markets. Although free trade policy was not fully in place until 1846, the process of abolishing the restrictions of the Navigation Acts (along with the additional tariffs and taxes adopted to pay for the war with France) began when Huskisson assumed the presidency of the Board of Trade in 1823 (Trevelyan 1937, Hobsbawm 1968).

Certainly some groups, especially the landed aristocracy, were still pressing for protectionist measures. But the rising industrialists were just as adamant in pressing for freer trade to enable them to completely exploit their advantages in production and transportation technologies. This differs from the experiences of Great Britain and the United States in the last two centuries, in which the main economic interest groups that were created in the nineteenth and twentieth centuries do not appear to have been forced to confront such a crisis until their states' positions were too weak for recovery (although the jury is still out on the United States).

The fate of Britain's eighteenth-century global economic order leads one to generalize the argument of the hegemonic stability group that liberal economic orders tend to destroy their liberal character to simply positing that economic orders may tend to destroy their ideological character. There is, of course, a fundamental difference in the way this process occurred in the nineteenth and twentieth centuries (as Gilpin analyzed it) and the way it developed in the eighteenth century. In the nineteenth and twentieth centuries, the global economic order allowed the primary economic actors to transfer the dominant state's wealth to challenging and peripheral states. This resulted in the relative decline of that core state to the point where the system that it created was challenged by other states that had reaped the advantages of this transfer of wealth and, because of this process, the core state was too weak to defend its order. In the case of eighteenth-century Britain, the global economic order it created allowed domestic economic actors in newly industrialized sectors to flourish. These actors ultimately rejected the ideology that had ordered this advantageous economic system while, simultaneously, their economic activities enhanced the relative power of the state.

One can argue that one reason the hegemonic stability theorists do not acknowledge that eighteenth-century Britain took the lead role in ordering global economic relations is because the leadership functions that a state needed to perform in the eighteenth century were fundamentally different from the functions of the nineteenth and twentieth centuries. The hegemonic stability theorists fail to note that the world system (in both its political and economic components) has become increasingly complex over time. In the eighteenth century, world markets were terrifically disorganized. It was sufficient for the lead state to make efforts to attempt to: (1) regularize trade routes to encourage trading activity; (2) establish regularized connections with all the world's markets; and, (3) to continue to incorporate new regions of the world into a world market system centered in Europe. Britain performed these functions by using its navy to clear the seas of pirates and smugglers, by developing elaborate sets of trade agreements with both European states and non-European areas controlled by other European states, and by integrating (and expanding) its colonial markets.

By the nineteenth century, world trade routes and shipping were relatively secure and, given the increased complexity of the world market system (although this system was still being expanded and consolidated through colonial conquests and informal ties), a leader had to provide an entirely different range of commercial and monetary functions. With increased systemic complexity, came more demanding leadership functions in the global economy: "accepting its redundant commodities, maintaining a flow of investment capital, and discounting its paper" (Kindleberger 1973, 28).

It is important to recognize that any economic order--mercantilist or liberal--requires leadership. Under any set of rules there will be challengers and cheaters. Under American leadership in the twentieth century, we have come to call cheaters "protectionists" or "socialists." In the eighteenth century, the cheaters attempted to evade state controls and follow market forces; they were labeled pirates and smugglers. Given the relatively primitive world market system in the eighteenth century, mercantilism may have provided the most effective ordering principles for leadership. It should also be recognized that hegemony is not a necessary condition for leadership in a mercantilist order (and perhaps this would apply in a liberal order as well). The concepts of hegemony and leadership should, therefore, be carefully separated.

The most significant difference between hegemonic stability and long cycles has been their respective views of the applicability of their somewhat similar tools of analysis to various periods of history. As pointed out above, the hegemonic stability theorists have only examined the last two centuries, considering earlier centuries to lack a hegemon or leader and to reveal entirely different international dynamics. If the hegemonic stability group were right, and I believe my case study has demonstrated that they are mistaken, it would undermine much of the work of long cycles. But if my case study and analysis of the eighteenth century's global economic order stands up under scrutiny, it would demonstrate that long-cycle theory can absorb or replace the hegemonic stability approach because of its superior explanatory power based on similar analytic tools.

This is not to suggest that long-cycle theory has nothing to learn from the work of the hegemonic stability theorists. Because of their more narrow time- and issue-focus, they have done sophisticated work on how international political and economic relations have developed during the last two centuries. This work can quite usefully be drawn upon in the effort to elaborate further long-cycle theory and enhance its detail and clarity concerning the last two centuries. Yet the hegemonic stability theorists have mistakenly narrowed their focus to the ways in which liberal international economic orders are established, maintained, and challenged when, given their tools of analysis, they might have done so much more. Given that we currently live with such an order, these questions are naturally important. Focusing solely on liberal orders, however, conceals important continuities with the dynamics of establishing and maintaining pre-nineteenth century, non-liberal orders in the global economy.

Notes

1. The works cited in the text are simply the authors' most important or notable contributions to the development of the hegemonic stability theory. For a more complete listing, see the bibliography. Robert Keohane is perhaps the least at ease with the hegemonic stability theory, as his recent work (1984) demonstrates. See his note on p. 213 of After Hegemony.

2. Social scientists are not the only ones to date the "modern world" as beginning around 1500. For example, the historian Joseph Strayer has marked the end of the Hundred Years War in Europe, 1453, as the turning point in the creation of the modern state. It was not until this time of peace, Strayer argues, that kings could turn their attention to elaborating and extending their state mechanisms, and it was after this process was begun that one can identify the creation of a modern state system with extensive diplomatic interactions based on these new bureaucracies (1970, 89-90).

3. Some of Kindleberger's more purely economic works have treated with pre-nineteenth-century developments. See, especially, his recent A Financial History of Western Europe, (1984).

4. Albert Bressand, The State of the World Economy: RAMSES 1982, (1982) 309. For an argument against the idea that the United States' hegemony has eroded, see Bruce Russett, "The Mysterious Case of Vanishing Hegemony; or, Is Mark Twain Really Dead?" International Organization, 39: 2 (Spring, 1985), 207-231.

5. For a sense of the evolution of this feeling of the need by the United States to take the responsibility for establishing a stable international economic order, see Richard Gardner (1980). Any of the memoirs of U.S. foreign policy makers in the post-World War II era also clearly communicate a conscious awareness of America's unique world role; see, especially, Dean Acheson (1969) or, for the views of a Department of State official on the margins of the critical decisions made in 1947, see Jones (1955). Jones writes of how "world leadership, with all its burdens and all its glory," was handed "to the United States" when the British withdrew from supporting Greece and Turkey in February 1947. About the cultural basis for the hegemonic stability theorist's approach, Susan Strange makes a similar point about the "hot" new field of regimes (1982).

6. It should be noted that much of Robert Keohane's most recent work, After Hegemony, is an attempt to clarify the conditions under which states may cooperate in maintaining--not establishing--a nonhegemonially based international order. See, especially, pp. 49-132. For work along a similar line, see Kenneth Oye, ed. Cooperation Under Anarchy (1986).

7. This point is also implied by Kindleberger in his analysis of Britain's post-World War One international economic policies in The World in Depression (1973).

8. By the phrase "the structure of the international state system," I

mean the distribution of power capabilities among states. See Keohane and Nye, (1977, 20).

9. See, for example: Viner (1948), Wilson (1965), or Heckscher (1955 1 and 2: ch. 1).

10. D. K. Fieldhouse (1965) has written: "In 1699 an act forbade the loading of wool, wool yarn or cloth produced in any colony in any ship, thus limiting colonial textile production to local needs. In 1732, the Hat Act banned the export of hats from one colony to another and imposed English regulation on apprenticeship and labor. In 1750 the Iron Act banned the establishment of new slitting or rolling mills, plating forges or steel furnaces in the colonies, while encouraging the production of pig and bar iron for export to England."

11. This superior strategic position resulted from Britain's insularity from continental conflict. This allowed the British to allocate a greater percentage of their resources to building a navy, whereas the Dutch, sharing common borders with the French, were in a position that forced them to pour resources into providing an army. Note that Braudel characterizes England's displacement of the Dutch as a long process that was not secured until the Treaty of Versailles in 1783--although its supremacy could be "glimpsed" in 1713, at the time of the Treaty of Utrecht The Perspective of the World (1984) 352.

12. It should be noted that in Frank's original diagram, France and England were placed in the same box. He did this to emphasize the similar role played by the English and the French in the slave-trading network. I feel justified in separating the two countries in my variation of his chart because England did enjoy all the relations represented on the diagram, but France had little or no contact with British North America, the Southern colonies, Latin America, Portugal, or the Baltic. After 1763, many of France's ties with Asia and North America were disrupted. Of course, after the American colonies won their independence, France was able to reestablish some degree of trade with North America.

13. The Asiento negotiations were a part of the broader treaty negotiations, culminating in the Peace of Utrecht ending the Wars of Louis XIV; see H.G. Pitt, "The Pacification of Utrecht," The New Cambridge Modern History, VI: The Rise of Great Britain and Russia, 1688-1725 (1971) 460-476.

14. For an insight into the eighteenth-century British view of piracy, see Fry (1970 ch. 6) on Dalrymple's service in the East India Company.

15. See the charts in Wright (1965, 644, tables 34 and 35) for clarification on the types of wars fought.

16. This interpretation is, I believe, one implication of Viner's (1937 58-118) arguments about British theories of trade prior to Adam Smith. Viner seems to see the movement from protectionist to free trade policies as a process of the discovery of economic truths championed by self-interested economic actors.

8

Suzanne Y. Frederick

The Instability of Free Trade

In the past decade, an academic growth industry has sprouted from one simple observation: during the nineteenth and twentieth centuries, a hegemonic (unicentric) distribution of global power capabilities appears to be associated with a more stable, cooperative, and prosperous world trade network (Kindleberger 1973; Krasner 1976; Gilpin 1975, 1981; Keohane and Nye 1977). Multicentricity, moreover, appears to decrease transnational business confidence and produce a protectionism-conflict spiral in international trade relations; hence, there is a proposed correspondence between hegemonic leadership and freer trade. Empirical evidence does lend some support to this proposition.

Stephen Krasner (1976) argues that an ascending hegemonic state is likely to use its increasingly preponderant shares of systemic economic power to create a more liberal economic order--one in which trade barriers are substantially lowered within the world economy. But a growing number of critiques have challenged Krasner's hegemonic leadership model by demonstrating the influences of domestic and/or regional politics and cyclical economic fluctuations on the trade policy decisions made by individual nation-states (Keohane 1980, 1982, 1984; Conybeare 1983; Cowhey and Long 1983; Lawson 1983; Gallarotti 1985; Strange 1985). It is fair to say, then, that the relationship between the systemic distribution of power and the policy structure of international trade remains uncertain, at best.

An Alternate View of Power and Policy

In spite of the many competing influences (including both domestic and international, political and economic factors) that can bring about changes in trade policy, the probable connection between periods of systemic economic leadership and macrochanges in the climate of world trade supports further efforts to find systemic explanations (Cippola 1970; Gilpin 1981; Maddison 1982). However, support for the proposition that systemic structural change in the political realm is a substantial influence on world economic relations must address the following questions:

1. Conceptually, both order and stability presuppose an established order. How, when, and within what sort of systemic capability distribution have novel structural trade relationships been established? maintained? challenged? replaced?
2. Which specific political and economic capabilities have been critical to this process?
3. Has there been a pattern of correspondence between the periodic concentration/deconcentration of these capabilities and the relative degree of trade liberalization in the world economy?

There is surprisingly little agreement among the loosely affiliated hegemonic leadership arguments on answers to the first two questions, although it is a general consensus on the third that defines their approach.[1]

This chapter is an effort to address these questions by proposing a model based on George Modelski's long cycle of world leadership (1978, 1980, 1981, 1982, 1983). Comparison of a long-cycle approach with the hegemonic stability/leadership approaches suggests that economic "hegemony" and systemic political leadership are analytically distinct processes, which may or may not be synchronized. The recent experience and the future prospects of the United States in a changing international trade structure lend special urgency and interest to understanding the world political dimensions of trade.

The Krasner Model

Free trade and a stable political climate are linked practically by definition. Obviously, interstate conflict and nationalistic economic competition are enemies of more open trading arrangements. By an easy extension, freer-trading periods should correspond to a relatively higher degree of political order and confidence in international business conditions. The stability provided by both the hegemon's economic primacy and by its role as the financial center of trade creates a foundation for this increased order and confidence.

Hegemonic leaders open their home markets to foreign goods and thereby provide the confidence required to allow other trading states to do the same. As cooperating states lower tariffs and other political trade barriers, substantial increases in the volume of world trade proportionately increase gains from trade for all system members.[2] A relative decline in the hegemon's economic preponderance, however, reduces both confidence in its strength and the influence of its policies. Under conditions of hegemonic decline, then, the deconcentration of systemic power contributes to an increased preference for protectionist measures as trade conditions become less certain.

Answers to how and within what sort of global power configuration these fluctuations in foreign commercial policy occur are proposed in Krasner's influential 1976 article "State Power and the Structure of International Trade." In the Krasner model, the systemic power hierarchy is defined by the lead state's relative share of world economic activity. "Openness" is the central descriptive feature of the trade structure: between the extremes of autarky and free trade lies a continuum of relative protection from import competition that reflects the level of systemic cooperation with the hegemon's preference for freer trade.[3] The model predicts that openness will tend to vary, in general, with the pattern of ascending and declining hegemonic power within the world system. That is, trade tends to be freer during periods of ascending hegemony, and tends toward closure during hegemonic decline.

The power shares of hegemonic states are determined by a comparison with the shares of its nearest competitor state among the major trading partners in the system. The relative shares of world income, international trade, and international investment are used as components of a composite measure of "potential economic power." Krasner proposes that an unambiguous concentration of potential economic power in one "hegemonic" state provides it with a systemic political influence capable of changing the patterns of market accessability among its major trading partners. Calculations of this potential economic power result in the following periodization:

> The peak of British ascendance occurred around 1880, when Britain's relative per capita income, share of world trade, and share of investment flows reached their highest levels. Britain's potential dominance in 1880 and 1900 was particularly striking in the international economic system, where her share of trade and foreign investment was about twice as large as that of any other state. It was only after the First World War that the United States became relatively larger and more developed in terms of all four indicators. This potential dominance reached new and dramatic heights between 1945 and 1960. Since then the relative position of the United States has declined . . . (1976, 332).

The following pattern is suggested by the relationship between potential economic power concentration and the policies and patterns of trade:

1. 1820-1879--ascending British hegemony, lower trade barriers
2. 1880-1900--some decay of British hegemony, rising tariffs
3. 1900-1913--declining British hegemony, rising tariff rates
4. 1919-1939--ascending U.S. hegemony, model predicts lower tariff rates
5. 1945-1960--sharply ascending U.S. hegemony, lower tariff rates
6. 1960-present--declining U.S. hegemony, rising trade barriers predicted

The remarkable periods of trade liberalization of the nineteenth and twentieth centuries, from 1860-1880, and from around 1965-1979 do appear to occur near the peaks of hegemonic power concentration. But there are several problems with the overall pattern of liberalization in relation to the state power model.

If the economic preponderance of the hegemonic state is a key factor in the decision to lower trade barriers, it does not necessarily follow that a relative decline in that preponderance is an equally critical cue for raising them. For instance, Britain's faltering systemic leadership is proposed to have contributed to a swift turnaround in European trade policies--a return to higher tariffs--by around 1880. Yet declining U.S. primacy from 1960 on has not reversed the trend toward lower tariffs. In fact, the tariff reductions of the late 1960s and the 1970s have been quite remarkable in spite of the mitigating effects of nontariff barriers. These two very different outcomes suggest that signals of a decline in systemic order may involve important factors other than simply the economic preponderance of the lead state.[4]

Both Britain and the United States appear to have resisted domestic pressures to turn toward protectionism in periods of general systemic deliberalization of trade. Apparently, only nonhegemonic states fall into the pattern predicted by the model in periods of economic deconcentration. As an explanation for this disagreement of model and evidence in periods three, four, and six, Krasner states that "Great Britain and the United States have both been prevented from making [policy] amendments in line with state interests by particular societal groups whose power had been enhanced by earlier state policies" (1976, 318). This explanation, however, abandons the systemic argument by attributing peculiarities of the hegemon's policy decisions to a domestic trait (institutional rigidity) that most certainly exists in other states as well. Moreover, this trait is advanced as a decided influence in both the U.S. ascending power concentration period and the period of waning British power. This is difficult to reconcile with the basic tenets of the state power model that tell us to expect ascending hegemonic states to prefer and promote freer trade and declining hegemonic states to contribute to greater encapsulation of national trade markets.

How Does Hegemonic Leadership Work?

Krasner proposes that an ascending hegemon can secure its preferred commercial climate--lower tariff barriers to the home markets of major trading partners--through bribery or coercion based on its sheer economic preponderance (cf. McKeown 1983, 76). He also posits a powerful cultural influence for hegemonic leadership in setting an example of the many benefits to be gained through opening the home market to international producers. That is, domestic free trade interest groups are provided with a persuasively prosperous example of the advantages of expanding trade through reducing tariffs. But as plausible as bribery, coercion, and example may seem as manifestations of hegemonic leadership, there is a surprising lack of evidence for such influences in commercial policy-making by nonhegemonic states.

For instance, U.S. resistance to economic and/or cultural cues from Great Britain to lower tariffs during the nineteenth century cannot be explained by the state power model. Although Krasner proposes regional limits to hegemonic leadership, the importance of the United States' share of world trade and U.S. receipt of a large share of Britain's foreign capital investment makes the possibility of U.S. aloofness from British influences unlikely. Also, there were no apparent British initiatives or political machinations involved in reaching the French and German tariff reduction agreements of the mid-nineteenth century (McKeown 1983, 83). In the twentieth century (during the 1945-1960 portion of the U.S. ascending hegemony), Japan was afforded both a highly protected home market and easy access to the U.S. market; yet in subsequent trade agreements, Japan has not been economically or culturally moved by U.S. preferences to grant the United States a fully satisfactory access to the Japanese market.

When Does Hegemonic Leadership Influence Liberalization?

The indeterminate influences of hegemonic leadership are further confounded by the uncertain timing of its effects. Reductions of British, French, and German tariff rates in the nineteenth century began--and, in the French and German cases, ended--before the proposed peak of potential economic power concentration around 1880-1900. In the twentieth century, the dramatic tariff reductions of the Kennedy (1967) and Tokyo (1979) rounds of GATT negotiations have come after the reported peak of U.S. potential economic power by 1960. If there is a lag or a lead effect of potential economic power on the world trade structure, it is clearly not consistent in the two test periods.

It is also unclear how levels of systemic economic power concentration may differ before and after peak periods of concentration; that is, similar levels of potential economic power may obtain during hegemonic ascent or decline, but those same levels are expected to have different effects on the commercial policy climate of world trade (cf. McKeown 1983, 76). We are left to conclude that there is no specific link between levels of potential economic power concentration and the relative openness of trade, but that the presence of a decidedly preponderant economic hegemon tends to produce more openness by uncertain means, at uncertain times, and within an indeterminate configuration of systemic power capability concentration.

Krasner concludes that both Great Britain and the United States have apparently had "the interest and the resources to create a structure characterized by lower tariffs" (1976, 323). However, since this approach cannot explain how or when economic power concentration persuades recalcitrant protectionist competitors to reduce their trade barriers, the argument is not wholly convincing. Also, as Gallarotti (1985) has pointedly observed, the hegemonic approach "fails a crucial case test," in that it can neither explain Britain's maintenance of openness during the 1900-1913 period of hegemonic decline nor U.S. protectionism as an ascending hegemon from 1919-1939.

Krasner's perspective of the power/policy connection is so broadly drawn that it presents the possibility of refining the model from a different theoretical vantage. The process of historical structural change in trade relationships may certainly be related to the distribution of systemic power, but there is little evidence to suggest that economic preponderance--in itself--represents the critical capability for shaping the structure of trade. For that matter, there is no certainty that economic concentration is synchronized with high levels of systemic political clout.

A long-cycle perspective of world leadership leads to a different (but occasionally overlapping) interpretation of the systemic power hierarchy. The long-cycle approach emphasizes the importance of specific military capability distribution patterns to the level of world order and the creation of novel international commercial patterns. Beyond this fundamental difference, there are also several other features that further differentiate a long cycle approach from Krasner's hegemonic leadership approach.

A Long Cycle Perspective of World Leadership

The concept of world leadership is treated very differently in long-cycle theory than it is in hegemonic stability theory.[5] Hegemonic leadership is conceived of as predominantly economic in nature, with Krasner's conceptualization among the most extreme in this regard.[6] In contrast, the long-cycle perspective proposes that minimum threshold levels of systemic political-military capability concentration have historically been required to provide both the opportunity and the authority for a lead state to make the rules for world trade.

The long cycle describes the systemic concentration/deconcentration of the means of superior political and economic competition within the world system. An underlying assumption of long-cycle theory is that the concentration of political-military power in the world system is cyclical and related to periods of global war.[7] Thompson outlines the high capability concentration, high order phase of the long cycle:

> During and immediately after a global war, one state emerges with a preponderance of naval power, the military resource critical for global reach, and the system's lead economy. This state assumes the leadership role of world power and proceeds to establish a new structure of rules for the global political system (1984, 7-8).

At least until the present, global wars have been the key disruptions of world economic and political relationships that have accommodated a political reorganization of the world trade structure by a world power.

The underlying structure of the world system during the world leadership phase of the long cycle is a unicentric concentration of the capacity for global reach. Global reach is based on ocean-going naval power (involving, more recently, air and space power) as the decisive means of superior political competition in the modern world system. These capabilities are crucial to success in global wars and underwrite the authority for world leadership by the eventual successor to world power (Thompson 1983b).

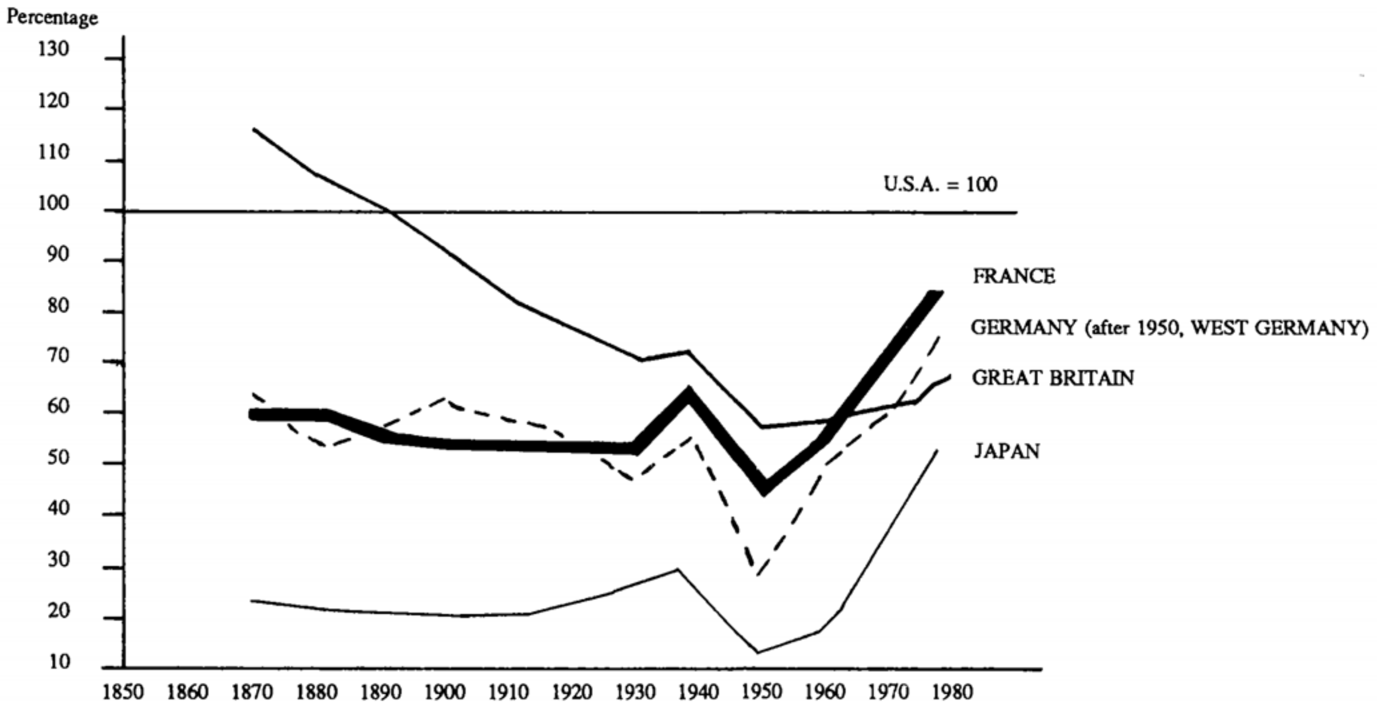
Even though the long cycle emphasizes the centrality of political-military capabilities, it does not propose that economic capabilities are second-rate considerations in world leadership. Instead, there are distinctive qualities that separate a lead economy--protected by a lead polity (world power)--from all other economies in the system.

A lead economy in the long-cycle sense is easily distinguished from economic hegemony in the Krasnerian sense of, say, Britain in 1880 or 1900. A lead economy is qualitatively required to be the systemic locus of creating leading economic sectors, to demonstrate a clear technical productive advantage, and/or to possess an advanced agriculture or agricultural organization. A high degree of systemic order and domestic security based on the unambiguous concentration of political-military superiority in the lead state promotes and protects such an active zone of economic vigor.

Nineteenth-century Britain provides a vivid illustration of the differences between a lead economy and economic hegemony. Britain possessed the qualities of a lead economy in the first decades following the Napoleonic Wars; yet, in spite of the impressive prosperity Britain enjoyed in the last quarter of the nineteenth century, the center of economic vigor in productivity (see Figure 8.1), leading sector development, and superior agricultural organization had, by that time, shifted to the United States, and in some respects, to Germany. The passage of world economic primacy from Britain to the United States is described by Maddison:

> The emergence of the U.S.A. as the technical leader was due to the fact that it had huge natural resources of land and minerals, which by 1890 had been opened up by improvements in transport and the creation of a vast internal market whose population was much bigger than any of the advanced European countries and was growing much faster. American productivity in 1890 was already appreciably higher than British in both agriculture and industry, and lower in services. In agriculture and mining a good deal of the U.S. advantage was due to

Figure 8.1 Productivity as a Percentage of U.S. GDP/Man-Hour (U.S. productivity = 100)



Source: Maddison (1982, 98)

> its superior natural resource endowment (1982, 39).

Britain, then, may have been the most prosperous economy in the system in 1880 and 1900, but it had definitely lost the qualities of a lead economy.

Krasner assumes that technical productive advantage increases throughout the period of hegemonic ascent (1976, 322). However, Figure 8.1 shows a steady decline in the relative technical-productive advantage of Britain from at least 1870 and a similar pattern of declining advantage for the United States after 1950. These developments indicate an erosion of leadership capabilities well before Krasner's proposed peaks of hegemonic power for Britain in 1880-1900 and the United States in around 1960. We may conclude that economic preponderance is not necessarily synchronized with qualitative economic leadership in either the nineteenth- or twentieth-century examples of hegemonic leadership.

Long-cycle theory proposes that the qualities of a lead economy reflect the predominant means of superior commercial/industrial competition in the world economy. Diffusion of lead economy capabilities is assumed to proceed more or less reciprocally with the deconcentration of political-military leadership capabilities, in the course of long-cycle oscillations in system structure. In sum, it is the co-occurrence of concentrated political-military and economic competitive advantage that distinguishes periods of long-cycle world leadership from hegemony in the sense of economic preponderance.

How Does Long Cycle World Leadership Work?

A world power is afforded the opportunity to create new trade structures through the combined effects of its monopoly on systemic capabilities and the relative weakness of all other states following a global war. This set of circumstances has rarely--but regularly--occurred in the modern world system during cycles of approximately one hundred years duration. Modelski describes the long-cycle scenario of the relationship between a unicentric political-military capability distribution and the structure (or perhaps more precisely, infrastructure) of international trade for the last five hundred years or so:

> Historically, the rules governing trade routes

> and trade conditions, fixing currency regimes, and determining investment opportunities have emerged in the modern world system following a period of global war. . . . The ascendance and the superior bargaining strength of the world power make it evident that such macrodecisions (those determining the large structures of economic life) as occur when its influence is at its peak will accord with its visions and interests. . . . The basic relation is that of the world power providing, among its range of political goods and services and through its own international economic policies and its initiatives in global arrangements the political basis for global economic arrangements (1981, 71).

This "political basis" does not imply that world leadership is synonymous with world control or world government. Rather, world power leadership is "a system for keeping order at the global level in respect of overall security and global economic relations, but not in respect of all national peculiarities of local administration" (Modelski 1983, 13).

In this scheme of trade structure creation, order is established by the unilateral design of global economic relations by the one successor to world power selected in global war. Change in that order (and therefore a probability of some policy adjustment) comes as a result of the diffusion of economic and political-military capabilities as the other states in the system recover from the losses of the global war period. The gains of its rising competitors diminish the monopoly on systemic perquisites held by the world power. By the end of the world power phase of the long cycle, political-military and lead economy capabilities drop below the threshold levels of concentration necessary for the lead state to maintain or adjust the trade structure in ways likely to restore and perpetuate its capabilities for world leadership.[8]

The relative decline of the extraordinary advantage of lead states may be accelerated by the very acts of system leadership. For instance, several studies propose that the costs of both domestic defense burdens and systemic order keeping for a lead polity may sap its growth rate and retard its domestic investment rate.[9] Such costs act as both a drag on the lead state's economy and a boost for its competitors who benefit disproportionately from systemic stability while bearing few of its costs. The role of lead economy and center-of-world-trade finance and services may also encourage diversion of domestic capital formation due to the opportunities for high-profit/low-entry-cost service ventures and foreign investments. This diversion may also compound the tendency of security costs to reduce domestic capital investment. In these ways, a lead economy slowly changes its foundation for successful world industrial competition into a foundation for prosperity based on service "invisibles" and investment returns.

When Does World Power Leadership Influence Trade Liberalization?

The first postglobal war decades are periods of extreme competitive advantage in both political/policy arrangements and commercial/industrial domination for the world power. The structure of trade in a world power leadership phase is likely to provide considerable protection for the interests of the world power's domestic produces. The trade structure is custom-fitted to suit the postwar competitive situation--one lead economy and several recovering economies. We may assume that a substantial decay of the world leadership/lead economy foundation that underlies the systemic primacy of the lead state will be a catalyst for many adjustments and changes, including changes in commercial policies of its competitors.

A willingness by rising competitors to make concessions in trade liberalization by the end of the world power leadership period attends their improved competitive position in the world market for a time. Such willingness has typically been short-lived because competition for markets continues to increase and domestic adjustment costs continue to rise in an increasingly multicentric system of competing states. A trend toward greater systemic openness of markets, therefore, appears to be more likely during a transition period between high concentration of systemic capabilities and lower levels of concentration.

A key contribution of long-cycle theory to the question of systemic trade policy patterns is in establishing the critical influence of rhythms in international politics for outcomes in world economic arrangements. Modelski proposes that a model of "alternating innovations" characterizes these links between the global polity and the global economy.

> We do assume these two structures of the world system to be related, because they both draw on the same population and on the same global (hence at any given point, finite) base of resources. The more goes for economic growth, the less is left for other social purposes. The more politics consumes attention and resources the less can be invested in wealth creation (1981, 75).

The coordinating mechanism in this model is a "value-price priority system." Priorities reflect global-level alternating increases in the scarcity of political and economic goods (the former being order and security, the latter providing a level of social stability) "with politics coming into play to deal with problems created by economics or those economic progress has left unresolved and economics, in its turn, attending to the social system laid to waste by periods of excessive devotion to politics" (1981, 75).

Global war, then, by severely disrupting the world economy, promotes first a high demand for security and stability that--when relatively stated--gives way to a value-price demand for economic opportunity. In this model, we might expect market openness for trade to increase for a time as the demand for and concentration of political-military capabilities diminishes. Subsequent lower levels of systemic order and stability that obtain through the course of the long cycle make indefinite liberalization unlikely.

Support for this proposition may be found by comparing the two periods of severe economic depression in the nineteenth century. In both the 1830s and the 1870s there were system-shocking downturns in the world economy: liberalization of trade was pursued in the recovery period in the former case, but only Britain resisted the pressures toward market encapsulation after the latter. A long-cycle explanation would propose that the lower level of systemic order in the last quarter of the nineteenth century influences the contrasting systemic policy patterns, which emerge in the two cases.

Measuring Power Concentration and Trade Barriers

Global Power Concentration

Even though hegemonic stability theory has become a staple among contending international relations approaches, hegemony has yet to be operationalized. In contrast, considerable attention has been devoted to operationalizing global reach capabilities within the framework of the long cycle. Global reach is measured in capital ships and naval expenditures as indicators of seapower (air power, space power) from 1494 to 1983 (Thompson 1980, 1981; Modelski and Thompson, 1987).

Threshold levels of systemic concentration of global reach capabilities necessary to world power leadership are described by Thompson:

> While the long cycle does not make use of the hegemony concept, it does operationalize the naval preponderance/leadership threshold as constituting fifty percent of the combined capabilities of the global powers (an elite group of states meeting minimal criteria for naval capabilities of global reach) immediately after a global war. Use of the fifty percent threshold does not mean that naval leadership is forfeited when the threshold is no longer equalled or exceeded. After all, the difference between fifty and say forty-five percent is not very meaningful, particularly if a challenging rival can only muster twenty-five percent. But the partially arbitrary threshold can be used to signal when naval preponderance or superiority is clearly evident (1984, 12).

High (50 percent or over) concentrations of ocean-going military capabilities correspond to high levels of order and security in the world system during world leadership periods.

While hegemonic leadership is examined only in the nineteenth and twentieth centuries, global reach is known to have traversed cycles of concentration/deconcentration from the beginnings of the modern world system to the present. The advantage of this breadth, for purposes of this chapter, is that it allows us to look at changes in the distribution of world power capabilities and changes in the structure of world trade in several more cases.

Even though the technology of trade, the goods traded, and the scale of world trade have changed enormously in the past five hundred years, the essence of trade and particularly the interests and intercessions of the nation-state in international exchange have remained remarkably constant. We might expect, then, that there will be some level of comparability between the power distribution/trade structure changes that occurred in much earlier periods and the better known events of the nineteenth and twentieth centuries.

Finally, while there is apparently no specific connection between the effectiveness of hegemonic leadership and the level of systemic economic power concentration, the long-cycle periodization of world power leadership can point to a consistent connection between power concentration and change in the structure of world trade. The five long cycles, to date, have seen the world leadership/lead economy of Portugal, the Netherlands, Great Britain (cycle III and recapturing world leadership in cycle IV), and the United States, in turn. Each world leader has, in its time, succeeded to world power through victory in a global war, ordered a system of international trade oriented to its own needs and to the long-range needs for systemic security and stability. Each leader, to the present, has experienced a loss of systemic political efficacy and economic primacy through phases of delegitimation and deconcentration (Modelski 1978, 1981, 1982). The four phases of political-military capability concentration/deconcentration have been presented in Table 1.1.

Tariffs

Unfortunately, tariffs and other trade barriers (as indicators of market accessability) present a perplexing--and so far, unsolved--set of operational problems. Tariffs have both revenue and "protection" functions that may vary in predominance through time. Also, tariffs are not of equal importance to government revenues from state to state. As a further interpretive complication, tariff (commercial policy) decisions are influenced by both domestic and international political and economic considerations unique to each state. Most importantly for our question, these influences, causes, and effects cannot be separated for analytical purposes.

The focus of our interest in tariffs is their function as protection from import competition for domestic producers. The effectiveness of a tariff may be measured by its ability to cushion or eliminate competitive pressure from foreign producers. However, it can be misleading to merely consider the statutory rate of taxation since the effective rate may be many times greater.[10]

In spite of such complicating factors in tariff interpretation, it is still possible to generalize levels of protectionism from tariff rates. A wide-ranging econometric test of tariff effects by La Vergne (1983) concludes that the average nominal (statutory) rate--that is, the average rate of taxation on those commodities subject to taxation--is the best indicator of relative state protectionism. The average rate is subject to fewer sources of error (effective rates are computed from average rates), although the existence of nontariff trade barriers undoubtedly introduces an element of imprecision to the measure. We assume that nontariff measures in one state are approximately counterbalanced with similar measures taken by its trading partners.

For the purposes of this chapter, the average tariff rate is the best, although a seriously flawed, indicator of levels of protection. The interpretation of average tariff rates should also be tempered by consideration of the effects of trade volume fluctuations. For instance, the average rate falls without an actual change in the tariff schedule statutes when there is an increase in the volume of low-tariff imports, such as the British experienced with imported grain after the repeal of the Corn Laws in 1846, and the increase of petroleum imports to the United States since 1972. The flood of low-tariff imports can mask much higher rates attached to products that may have greater importance to the structure of world market competition.

The following section describes the broad patterns of concentration and deconcentration of global reach in the modern world system and relates it to macrochanges in the structure of international trade.

A Long-Cycle View of Trade Structure and Power Distribution

In the preindustrial times of the first three long cycles of world leadership (from about 1500 to the Napoleonic Wars in the early 1800s), world power leadership by a lead economy was experienced on a far more modest scale than in subsequent cycles. The penetration and influence of the lead state has increased with each successive world power leadership era. Notwithstanding the many differences that exist among particular long cycles, a similar pattern of structural adjustments in trade that corresponds to the concentration/deconcentration of global reach is apparent as early as the Portuguese leadership in the first long cycle. In each of the five long cycles to the present, trade liberalization has emerged as a policy pattern during the diffusion of political and economic power within the system: that is, during the delegitimation/deconcentration phases of the long cycle.

The First Three Long Cycles

Long cycle 1--Portugal. Portugal attained its position as the first "world power" in the modern world system through its gains in the Italian and Indian Ocean Wars (1494-1516). Following the global war period, the Portuguese successfully exploited a monopoly on world trade (gained at the expense of Venice) through a successful experiment with an economic innovation--state capitalism. As Diffie and Winius note,

> never before or since has [a nation-state] become the entrepreneur of an entire imperial undertaking and thrown its whole resources into the creation of profits from a trading monopoly on its overseas discoveries (1977, 312).

A network of Portuguese customs stations and cities under direct or indirect control of the crown eventually spread around the African coast to India and Ceylon. The systemic structure of trade was further controlled by Portuguese shipping regulations and warehousing facilities for trade. The taxation of that trade produced sufficient revenue to support the crown's foreign trade outposts.

By the end of the world power phase of Portuguese leadership, Venice and other trade competitors had begun to revive: Diffie and Winius cite the failure of the Portuguese trade monopoly at around 1550 (1977, 415). Pressure from its rising competitors, as well as increasing problems in financing its yearly trade ventures, forced Portugal to seek more liberal trade relations with its outposts. In fact, by 1570, the Portuguese were engaged in essentially free trade with India. These policy adjustments, however, were not sufficient to counter the rapid loss of Portuguese predominance in world trade.

Long cycle 2: The Dutch. The seventeenth-century Dutch succeeded to a position of world power leadership in a global war period stretching from the Spanish seizure of Portugal from 1580 to 1609. The ascent to trade leadership was also aided by Dutch innovations in processing fish for trade, in shipbuilding, and in exploiting their fortuitous geographical position between the Baltic grain and timber wealth and southern European markets for these goods (Wilson 1957, 2-3). Wilson describes the timing and formation of the Dutch trade monopoly:

> Somewhere between the 1590s and the 1620s the Northern Provinces, in the process of throwing off Spanish suzerainty, became unquestionably the leading seafaring nation of the world. . . . The first half of the century saw a rapid growth of Dutch overseas trade in all aspects. To the expanding grain trade were added new trades in spices and oriental textiles as the great trading companies began to add all their commodities to the general stream of [Dutch centered] trade (1957, 3-4).

Further, the Dutch East India Company was able to improve on the Portuguese trade system by exploiting inter-Asian trade (Diffie and Winius 1977, 432), although the practice was hardly a long-term success financially. Dutch financial services became the center of international trade, and a successful network of Dutch warehousing and shipping regulations organized, and maximized Dutch benefits from, world trade.

Dutch predominance in the world economy began to erode due to the challenges of a rapidly rising British textile industry and the vulnerability of the natural and contrived commercial advantages of Dutch trade. Dutch order-keeping structures were beginning to crumble by the end of the Dutch world power period in the mid-1630s. Wilson notes that the de Witt period of Dutch political leadership, from

1653 to 1660, actively promoted freedom of trade as a hopeful source of economic vitality and prosperity as the Dutch international economic and political leadership waned (1957, 15-17). This preference for freer trade, as it had in the Portuguese case, emerged during the delegitimation/ deconcentration phase of the long cycle.

Long cycle 3: The British. The first British world power leadership period was established after a global war period that stretched from 1688-1713. Thomas and McCloskey pinpoint the great issue of the global leadership succession struggle:

> Shipping and the requisite merchant services (together called invisibles) must have grown at least as rapidly as did the exchange of goods (visibles). The issue of the seventeenth century--whether foreigners or Englishmen were to provide these services--was settled by the early eighteenth century. Encouraged by edict (the Navigation Acts) and by force of arms (the Dutch Wars), the English merchant fleet had become in the eighteenth century the most efficient in the world (1981, 92).

As a set of regulations for the bulk of international trade, the Navigation Acts (acts of Parliament dating from the 1650s and extending into the 1840s) instituted a high degree of British control over, and boosted British profits from, the world's commerce.

> The Navigation Acts . . . consisted of four types of regulations, governing: first, the nationality of the crews and the ownership of vessels in which foreign trade could be carried; second, the destinations to which certain colonial goods could be shipped; third, an elaborate system of rebates, drawbacks, import and export taxes in aid of particular industries at home; and, fourth, the manufactures in which the colonies were allowed to engage (Thomas and McCloskey 1981, 94).

Tariffs and other trade barriers were high in the period of Britain's world power leadership. English ports were the central clearing house for all trade with Britain or its colonies. The British banking, insurance, and other service "invisibles" became well established as the economic pivot of world trade. Yet, by the third quarter of the century, British commercial superiority had seriously eroded due to a French commercial challenge.

Two events in the delegitimation/deconcentration phase of the first British long cycle indicate an influence of freer trading interests and intentions. First, the publication of Adam Smith's *The Wealth of Nations* was only a beginning of dramatic changes in philosophical support for free trade. Second, the Treaty of Eden (signed with France in 1786) demonstrated a change in British mercantilist sentiments toward a desire for freer trade and an end to the complex tangle of commercial policy legislation, which constrained Britain's industrial resurgence just prior to the Napoleonic Wars. Although the treaty is frequently viewed as being much more favorable to Britain than to France, it did open the British market to French goods for a time[11] and represented a radical change in the French state's traditional devotion to high tariffs (Braudel 1983, 379-382; Henderson 1957).

Long cycles 4 and 5: The nineteenth-century British and twentieth-century U.S. cases of world power leadership. The French commercial challenge of the third quarter of the eighteenth century began to flag as the British developed new leading sectors in cotton textiles and pig iron in the 1770s (Rostow 1978, 379). However, France was politically supreme on the Continent and the struggle between Britain and France for systemic leadership was realized in the Napoleonic Wars.

> At issue in the clash between industrial Great Britain and Napoleonic France were two fundamentally opposed systems for organizing the world's economy and ultimately, of course, for dominating the globe. . . . Great Britain, in command of the seas and leading in the productive technologies of the Industrial Revolution, desired the creation of a world economy centered on her industrial and financial core (Gilpin 1975, 79-80).

Table 8.1 British Average Tariff Rates, 1800-1945

Year	Average Tariff Rates (%)	Year	Average Tariff Rates (%)
1800	29.5	1865	11.5
1805	34.2	1870	8.9
1810	40.7	1875	6.7
1815	45.1	1880	6.1
1820	43.8	1885	5.9
1825	53.1	1890	6.1
1830	47.2	1895	5.5
1835	40.5	1900	5.3
1840	30.9	1905	7.0
1845	32.3	1910	5.9
1850	25.3	1913	5.4
1855	19.5		
1860	15.0	1932	33.3

Source: Imlah (1958)

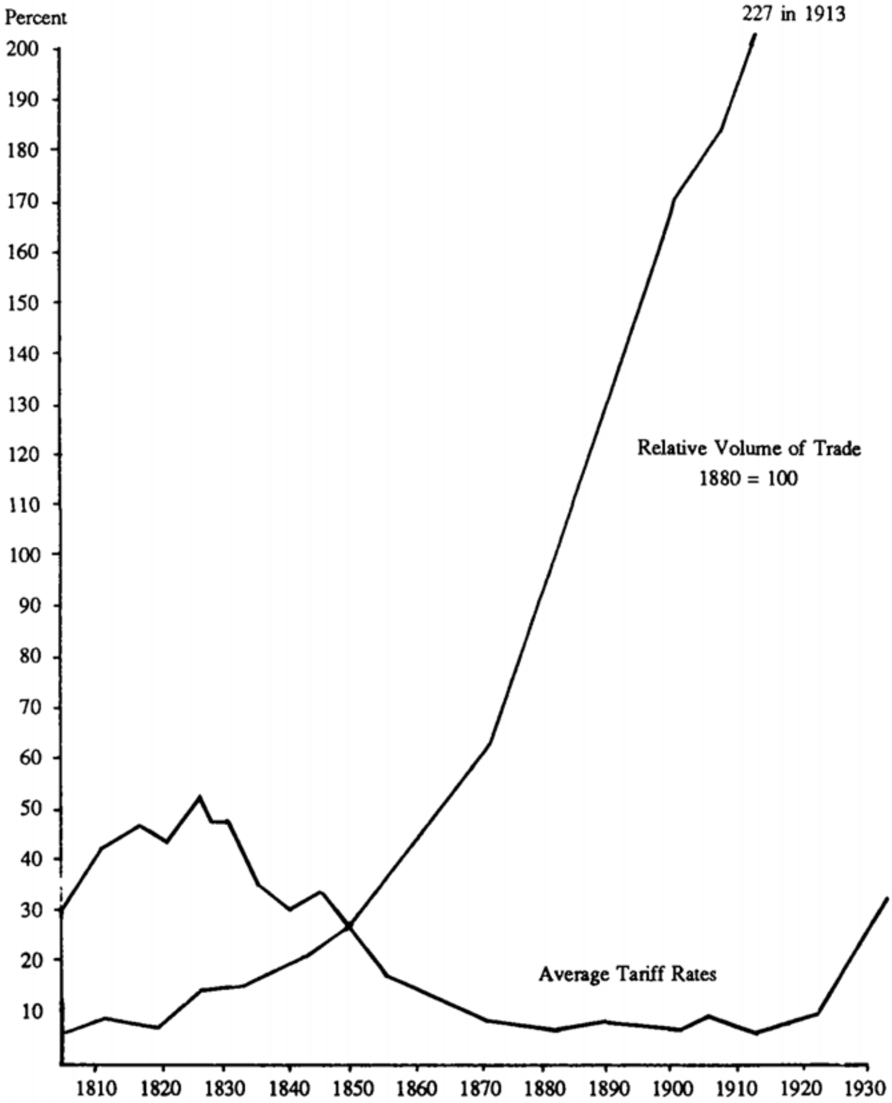
Success in the global war period allowed Britain to reclaim its position as world power and lead economy. The structure of world trade that emerged in the post-Napoleonic Wars system retained the Navigation Acts (frequently amended, but essentially intact) throughout the world power phase. The Corn Laws also shaped the structure of world trade and retarded development of competing agricultural organizations. Both sets of trade regulations were abandoned at almost precisely the end of Britain's world power leadership period in the late 1840s.

The subsequent turn to freer trade is thoroughly documented in nineteenth-century political and economic histories as a major event--often called the "golden age of free trade"--but it only lasted from around 1860 to 1880. Table 8.1 shows the mid-cycle liberalization of British tariff schedules: although France and other European trade partners soon returned to higher tariffs, the reduction of British tariffs continued quite spectacularly throughout the delegitimation/deconcentration period.

Even though trade volume was expanding rapidly (see Figure 8.2) challenges to British productive and innovative vigor became apparent by 1870. Development of U.S. leading sectors in steel, electricity, and motor vehicle production between 1870 and 1913 points up the relative decline of British industrial primacy, even as British shares of world economic rewards were reaching phenomenal concentration levels. At the same time, a less broadly based, yet far more threatening industrial challenge was growing in Germany.

Krasner's hegemonic leadership approach leads us to expect that highly concentrated economic preponderance

Figure 8.2 Volume of World Trade and British Average Tariff Rates, 1800-1932



Source: Imlah (1958)

corresponds to periods of systemic stability and freer trade. In the hegemonic scheme, Britain's peak of potential economic power was most striking in 1880 and 1900--in a period that will probably not be remembered for its orderly, predictable international relations. On the Continent, German industrial and military expansion in the last quarter of the nineteenth century transformed that backward agrarian newcomer to the states system into a serious contender for primacy in systemic capabilities (Kennedy 1980). In this same period of "peak" British economic clout, the United States surpassed Britain in manufacturing output and productivity (Maddison 1982, 38-39). There seems to be an absence of irresistible British influence in the commercial/industrial affairs of its trading partners, and in fact, the 1880-1900 era suffered several tariff wars among major European states (Ashley 1911). Taken together, these circumstances indicate that there is considerable dissynchronization possible between economic power concentration of the hegemonic ilk and concrete political influence for a leading state among its trade partners. Clearly, other circumstances, such as the repercussions of the 1873 world depression and structural change in world politics, had overridden the potential influence of economic preponderance.

By 1880, British leadership had eroded in the world system, the British home market was the most open in the European states system, and rivals to British economic preponderance were rapidly making inroads in established British markets. It is clear that the halcyon days of British economic and political primacy in the system (from 1816 to around 1848) were characterized by higher tariffs than the subsequent period of diffusion of those capabilities. In fact, the average tariff rate protecting British goods was nearly 40 percent in the world leadership period: in the course of the delegitimation/deconcentration period, the average rate fell to around 8 percent.

World War I fatally disrupted the British infrastructure for world trade. Yet, a new order was not to be established until the resolution of the global succession crisis in World War II (the long cycle designates the entire 1914-1945 period as one of global war). U.S. ascent to the stature of world power leadership was marked by institutional innovations in trade organization such as the General

Agreement on Tariffs and Trade (GATT) and the Bretton Woods monetary system. In the immediate postwar years, the United States also exercised considerable formal control over production and trade patterns for the European Economic Community and Japan. Whereas tariffs were reduced significantly in 1947, little pressure for systemic liberalization was asserted until the mid-1960s. Free trading interests were successful in dramatically reducing tariff rates in 1967 and again in 1979, at the same time that delegitimation of U.S. power capabilities was becoming apparent. The average tariff rate in the world power phase was around 15 percent: so far during the delegitimation period, it has fallen to around a 7.5 percent average (see Table 8.2). The relationship between these reductions and the volume of world trade is displayed in Figure 8.3. As in the nineteenth century, lowered trade barriers have encouraged a great increase in the volume of world trade--especially in the delegitimation/deconcentration period.

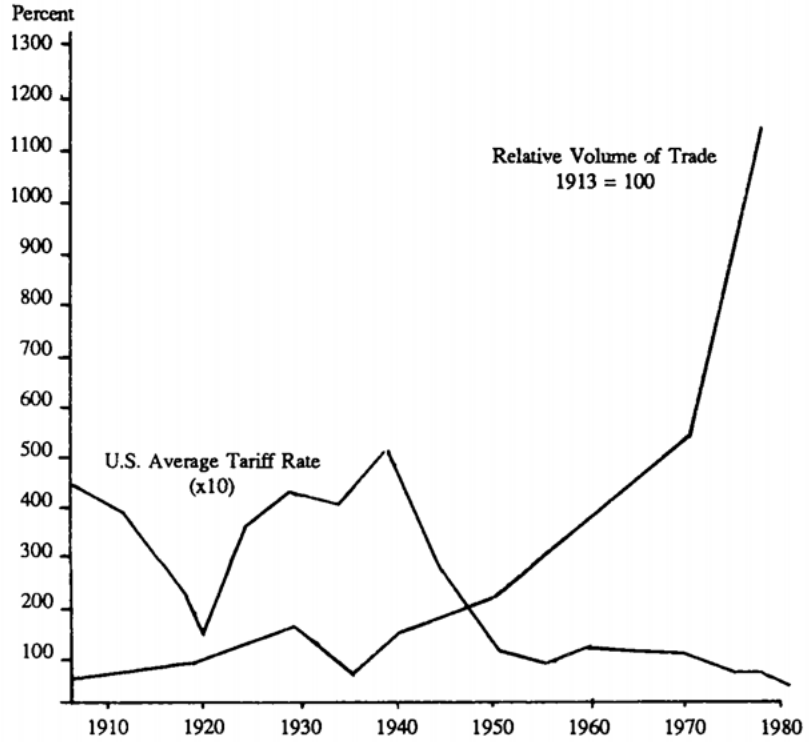
The institutional structure of world trade that Bretton Woods represented began to falter and, by the early 1970s, U.S. influence over the commercial climate of international trade was substantially diminished by the collapse of that agreement. At the same time, noncompliance with GATT

Table 8.2 United States Average Tariff Rates, 1821-1982

Year	Average Tariff Rates (%)	Year	Average Tariff Rates (%)
1821	45.0	1905	45.3
1825	50.5	1910	41.6
1830	61.7	1918	23.7
1835	40.4	1920	16.4
1840	34.4	1925	37.6
1845	34.5	1930	44.7
1850	27.1	1935	42.9
1855	26.8	1940	53.6
1860	19.6	1945	28.2
1865	47.6	1950	13.1
1870	47.1	1955	11.9
1875	40.6	1960	12.2
1880	43.5	1965	11.9
1885	46.1	1970	12.0
1890	44.6	1975	8.0
1895	42.2	1980	6.0
1900	49.5	1982	5.0

Sources: United States Department of Commerce, Historical Statistics of the United States, Colonial Times to 1970; United States Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1983.

Figure 8.3 Volume of World Trade and United States Average Tariff Rates, 1900-1980



Source: Maddison (1982, app. C) and Table 8.3.

principles and a proliferation of exceptions and loopholes in the rules of GATT became a persistent problem. U.S. preferences for freer trade are not matched by most of its rising industrial competitors in the 1980s. While protectionist pressure from domestic U.S. producers is a growing concern, President Reagan steadfastly discourages barriers to import competition.

U.S. preponderance after 1945 does suggest an approximate synchronization of high order and a high concentration of potential economic power. Actually, the hegemonic leadership timetable (1945-1960) and the long-cycle world leadership phase (1945-1973) overlap to a point in this instance. Following World War Two, the United States quickly assumed the role of world leadership in economic relations. Yet, even if it is possible to agree that it is both a high economic and a high political-military concentration period, there is some doubt that free trade was a compelling priority systemwide. U.S. philosophical preferences notwithstanding, after the tariff reductions of the 1947 initial round of GATT negotiations, subsequent rounds in 1949, 1951, 1956, and 1960 achieved only negligible or very modest progress toward liberalization.[12]

The five periods of world power leadership described above demonstrate that tariff reductions and systemic expansion of trade tend to occur with the deconcentration of global political capabilities as conceptualized by the long cycle. The model developed in this chapter builds on these observations and suggests that trade liberalization may be symptomatic of a decay in systemic political leadership rather than its fruition.

In each of the five cycles, the highest concentrations of competitive political and economic advantage have not been distinguished as those with the freest trade. Rather, we find that freer trade is likely to occur in the transitional period between unicentric and multicentric distributions of systemic power capabilities. The evidence further suggests that declining lead states are likely to cling to more open trading policies as the system evolves toward multicentricity, in spite of a broader systemic trend toward increased protectionism. The historical pattern that emerges in this section is summarized in Table 8.3.

A Long-Cycle Model of World Trade Structure

Our long-cycle view of the historical structural changes in global power concentration and trade structure strongly suggests that there is indeed a degree of synchronization

Table 8.3 Trade Policy Adjustment Patterns

Long-Cycle Phases	Dates	Lead State's Trade Barrier Patterns	Systemic Adjustment Patterns
World Power	1816-1848	High	High
Delegitimation	1849-1880	Lower	Lower
Deconcentration	1881-1913	Lowest	High
Global war	1914-1945	High	High
World power	1946-1973	Moderately high	High
Delegitimation	1974-	Lower	Lower
	1980's	Possibly lower	Probably higher

between the two processes. A model of macrostructural trade policy adjustments to the diffusion of the long cycle's global power capabilities appears to follow this broad pattern:

> *Phase One*--unicentric power concentration/high trade barriers
> *Phase Two*--some deconcentration of power/asymmetric liberalization (the lead economy adopts lower trade barriers than its trade partners)
> *Phase Three*--deconcentration toward multicentricity/ nearly unilateral openness of declining lead state's market-rising competitors strengthen import competition positions/ weakened order persists.

In phase one, the high protection from import competition may be a holdover from the preceding low order (multicentric) period and subsequent global war periods of increasing market encapsulation. Income from tariff revenues in the first period are also a basis for national postwar recovery (particularly in the nineteenth-century case) and serve a protective function by promoting growth of domestic production in recovering economies. The system's structure of trade is highly skewed toward competitive advantage for the world power/lead economy. Phase one is approximately synchronized with the world power phase of the long cycle.

In phase two, a turn toward freer trade accords well with the needs of both the leading state and its rising competitors within an expanding world economy. But, at some point in the systemic adjustment to lower tariffs, economic stagnation has historically curtailed liberalization by shrinking opportunity and sharpening competition for the world's markets. Domestic adjustment costs, such as unemployment and industrial dislocation/relocation, result from changing competitive relationships among states. Government policy makers, in response to the social costs of international competition, become more receptive to pressures from protectionist interest groups. As the system structure becomes one of ever more capable rising competitors, the liberalization of phase two gives way to a return to greater national market encapsulation.

The return to protectionist policies, however, is not joined by the declining lead state. Its opportunity costs of closure are greater than any other state's because the role of economic center of trade, finance services, and world investments so thoroughly integrates the lead state's economy with the world economy.[13] As a result, painful domestic adjustment costs of import competition are borne in preference to closure. This unique role of a declining world power/lead economy in patterns of systemic adjustment to changing power distribution remains a powerful influence on world economic patterns. The lead state accepts asymmetrical trade agreements (tolerates greater protectionism by other states) and remains committed to a nonretaliatory response to market restrictions its competitors might erect.[14]

In long cycles 4 and 5, the trade policy adjustment patterns fit rather well with the proposed long-cycle model. The long-cycle model suggests the following periodization:

1816-1848--high protection/high (unicentric) concentration of global power capabilities in Britain
1849-1880--asymmetric liberalization (Britain's trade barriers consistently lower than its partners')/weakening concentration of capabilities
1881-1913--nearly unilateral openness of British market/ increasingly multicentric global power distribution
1914-1945--global war/leadership succession struggle
1945-1973--relatively high protection/high (unicentric) concentration of global power capabilities in the United States
1973-present--asymmetric liberalization (U.S. average tariff rates consistently lower than its trade partners')/ weakening concentration of capabilities

In sum, the British-led liberalization of nineteenth-century trade was not realized until after the end of the world power phase of the long cycle. By around 1850, British tariffs began to be rapidly lowered. Beginning in 1860, several European trading systems lowered their tariff barriers through the agency of French treaty negotiations. When, by 1880, most of Britain's trading partners returned to high tariffs, Britain resisted domestic pressures to follow suit and remained, until World War I, the freest port in the world.

In the U.S. case of world leadership, systemwide liberalization trends were strongest at the end of and following the world power phase of the long cycle. Substantial acceleration in trade liberalization began in earnest with the Kennedy round of GATT talks (finalized in 1967) and continued with the Tokyo round (finalized in 1979). Finlayson and Zacher describe the reductions in trade barriers that were agreed to in the Kennedy Round of negotiations:

> . . . industrial countries [made] linear cuts of almost 40 percent on manufactured goods. Large tariff reductions were accepted by the four major participants--the U.S., EEC, the U.K., and Japan (1983, 283-284).

The Kennedy round also addressed the need for antidumping measures and achieved somewhat more modest reductions for agricultural goods. The Tokyo round (1979) brought a one-third reduction of tariffs on all industrial products by the developed countries. There are also demands from the LDCs for greater (asymmetrical) access to the home markets of the developed countries (Finlayson and Zacher 1983, 285-286). Through the 1970s there appeared to be a continuing commitment to liberalization of trade in spite of growing protectionist measures in the form of nontariff barriers. The increased presence and effectiveness of nontariff protectionism appear to be major influences on the structure of trade in the 1980s.[15]

The firm footing of long-cycle operationalization and the good fit of the evidence with the long-cycle model do not vitiate the hegemonic leadership approach. This proposed model does, however, represent a considerable fine tuning of the power/policy question. It further suggests that economic hegemony may not necessarily be synchronized and/or synonymous with systemic leadership in trade relations.

Conclusion

Long-cycle theory proposes several adjustments in the traditional concepts of power and systemic leadership. Although the specific means of superior political and economic competition posited by the long cycle are not at odds with broader concepts of military power and economic strength, they do represent a considerable refinement that emphasizes critical capabilities for systemic influence. By employing a long-cycle periodization of systemic oscillations between more unicentric and more multicentric power distributions, it is possible to demonstrate a correspondence to systemic trade policy patterns, which suggests that trade liberalization portends less stability and order, rather than more.

Rhythms in systemic power concentration/deconcentration do not imply that each new cycle closely imitates the preceding one. In the course of the five long cycles to date, there have been astounding changes in the volume of trade and in the operation of markets and of states. These changes have not been solely quantitative. The interdependence of trading states has increased along with the smoothness of market operations and the penetration and influences of governments. These changes do not, however, preclude some fundamental consistency in the interactions of global politics and economics through time.

Notes

1. Hegemonic stability theory is a broad category for several scholars' works. The central shared premise is that systemic order is greatest when there is a unicentric distribution of political and economic capabilities in the world system. A hegemonic leader will prefer--and tend to create--a more liberal economic order for trade. Relative decline of the leadership capabilities (predominantly economic power) of the hegemonic state is proposed to result in market encapsulation through state protectionist trade policies that are inspired by the erosion of systemic stability.

2. Krasner (1978) emphasizes that, even though all states benefit from the systemic stability established by the hegemonic leader, medium-sized states can upset that stability by adopting policies that break with the established order. Small states may alter their policies to maximize their benefits from the established order--but they are powerless to reshape it.

3. Stein (1984, 357) observes that liberalization is the standard term for tariff reductions, while openness generally refers to the volume of patterns of trade.

4. As McKeown (1983) points out, the worldwide depression of 1873 undoubtedly represents a fundamental incentive for the higher tariff rates of the 1880s.

5. Modelski differentiates emphatically between world leadership and hegemony. The principles of common interests and legitimacy that describe the historical role of leadership in the long-cycle sense are not equivalent to the connotations of dominance and tyranny implied in the word "hegemony."

6. Hegemonic stability/leadership arguments do not share a homogeneous set of answers about the bases and applications of fungible systemic power. An obvious difference is the relative importance given to political-military capabilities as underpinnings of influence in systemic trade relations. Krasner (1976) defines the systemic power hierarchy solely by the lead state's share of world economic activity. Krasner regards military power as impractical and inefficient as a tool for improving access to the home markets of trading partners. In a similar spirit, Keohane views military capabilities as background conditions for economic hegemony that ensure the lead state's access to its essential economic activities (1984, 40). Gilpin, however, goes con-

siderably further by making military supremacy an essential feature of a system leadership. Gilpin points out that victory in a hegemonic war has historically established the political-military prestige necessary for system dominance in economic relationships (1981, 32-35).

7. Global wars may be distinguished from all other wars because they have been the political competitions that have decided the successors to world power leadership. See discussions of classes of wars in Thompson (1983b, 1985).

8. This course of events resembles generalizations about structural change in the system proposed by Vayrnen (1983, 397).

9. The effects of defense burdens and systemic order-keeping costs are explored in Rasler and Thompson (1987).

10. Salvatore (1983) defines effective tariff rates as "the percentage increase in domestic value added in the production of a commodity as a result of tariffs." Essentially, it measures the actual price incentive mechanism of taxing--and thus providing protection from--imported manufactured goods at a greater rate than imported production inputs (raw materials). Salvatore notes that "most industrial nations have a 'cascading' tariff structure with very low or zero nominal tariffs on raw materials and higher and higher rates the greater the degree of processing." See Yeats (1974) for a discussion of "Effective Tariff Rates in the United States, the European Economic Community, and Japan."

11. Note that the increase in British consumption of French goods was due as much to a devaluation of French currency and to the reduction in the illegal trade (as a means of sidestepping the formerly formidable trade barriers) as it was to the treaty itself.

12. For a more detailed discussion of GATT negotiations and agreements, see Finlayson and Zacher (1983, 282-289).

13. Integration of the U.S. economy into the world economy is discussed in more empirical terms in Rupert and Rapkin (1985).

14. This process is explored by Stein (1984). Stein sees the lead state's preference for--and advantage in--liberalizing trade structures as creating a "dilemma" in which the preferred policies it adopts and encourages in other states necessarily undercut its lead position in the world economy. The "hegemon's dilemma" generally resembles Gilpin's argument that a failure to adjust to changing market conditions contributes to the strength of a declining lead state's competitors and hastens the decay of its own world standing (1975, ch. 1).

15. Bergsten and Williamson (1983, 99-120) propose that a prolonged overvaluation of U.S. currency is also a source of trade barrier effects that work against the United States in the world market (and are therefore a form of asymmetrical protection). In effect, overvaluation gives an added measure of protection against competition from U.S. goods in all foreign markets. See also comments in the same volume by Gottfried Haberler (pp. 203-209). Maddison (1982, 38) observes that overvaluation inhibits domestic investment and labor productivity. He states that declining lead states from the Netherlands to Britain to the United States have experienced prolonged periods of currency disequilibrium and overvaluation that encourage overdevelopment of the banking and trade service industries (pp. 29-42).

9

George Modelski

A Global Politics Scenario for the Year 2016

The question is: What might global politics be like by the year 2016? The answer given here is an attempt to project into the near future trends and patterns experienced by the world system over the past five centuries, as they are depicted in the theory of long cycles, so that such knowledge may be used for building a vision of the early twenty-first century.

The theory of long cycles is a means of describing and explaining the functioning of the global political system, a system that, like all systems, exhibits in its operation some notable regularities. The regularities of the long cycle are those of repetition and of evolution. The repetitive features of each systemic long cycle of a hundred years' duration are the four cycle phases of global war, world power, delegitimation, and deconcentration. The evolving characteristics of the global polity are apparent to anyone who has attempted to compare the quality and complexity of world politics today with conditions that prevailed as recently as five hundred years ago. The long cycle is a basic beat of social evolution.

Our analysis employs these patterns for making a prediction about the future; it projects them forward some thirty years, that is, about the average length of one cycle-phase. Other scenarios should only be envisaged as variations on this "standard" theme. Thirty years is, of course, the average time required for a generation to replace itself; hence long-cycle time is also generational time.

The purpose in looking at 2016 is twofold. In the first place, it is to cultivate our ability to think about the future. Contemporary "futurology" has paid much attention to questions of population, economic, and technological growth (as in the "limits-to-growth" literature of some years ago), but relatively little to world politics. Second, the spelling out of a scenario is a way of testing theory. As global politics unfolds on its course, the weaknesses of this analysis will stand revealed and its strengths will be reaffirmed. A theory that emerges from such a trial unscathed in its essentials will have literally withstood the test of time.

We aim at constructing not a series of alternative scenarios, but rather one vision of the near future that is well-grounded, coherent, and persuasive. Such a vision allows us to discern what Herman Kahn called the "basic multifold trend of Western society" (1967, 6-7), but that may more generally and more precisely be described as the "evolutionary process of the world system". Such a process does, of course, have its twists and turns and its ups and downs but, in its main drift, it may be charted and it is within that process that we seek to discern the future shape of global politics.

Methods

Three methods will be employed in this project: (1) pattern projection; (2) a "political learning process" explanation of the long cycle, and (3) "interface analysis," tracing the relationship between long cycles and other world system processes.

The principal method used is that of pattern projection. Our knowledge of the long cycle is now at a stage where an adequate description of its outlines is in hand. The periodic table of the long cycle, as in shown in Table 1.1, in Chapter One, summarizes that outline by drawing upon a half-millennium of modern experience; given the assumption of continuity, this pattern can be projected into a bounded future.

Gottfried Leibniz formulated the postulate of continuity by declaring that *natura non facit saltus* (Mandelbrot 1983, 412). More specifically, we agree with Robert Gilpin (1981, 211 ff) that "an underlying continuity characterizes world politics." This means that the accumulated experience of the functioning of the global polity furnishes us with precedents and patterns that continue to be valid even into the nuclear age.

But pattern projection is not enough. To make sense, patterns must be seen as products of a social process. The explanatory framework used here to explain the long cycle is a "political learning process" theory. It is, in the first place, a systemic theory because the long cycle is the mode of functioning of a system--the global polity. What we have, more precisely, is system analysis (in the sense of, e.g., Laszlo, or, for social systems, Parsons, or for political science, Easton). It is not an effort to predict "history," or "the future" as such but, rather, to specify the anticipated functioning, over the next three decades, of one particular system, the global polity. That system is expected to continue moving through the sequence of its phases.

What is more, the system's functioning through phases may be interpreted as proceeding in stages of a (Parsonian) learning process (Modelski 1987). Each phase of that time-differentiated process maximizes, in turn, one of the four major functional requirements of the system; each major functional requirement defines the basic agenda of that phase. The learning theory therefore makes it possible to anticipate the "problems" of each phase of the cycle, and the bulk of the discussion in part two of this chapter relies on that theory.

Finally, we employ "interface analysis." The global polity exists not in a void but, rather, lies *embedded* in the world system, and thus forms one part of a larger whole. Parts of a whole must cohere in some definable relationship. That adds to the difficulties in prediction because the relationship with at least the most important of the parts of that world system must be specified if the analysis is to be anywhere near complete. The global polity has to relate not only to the global system as a whole and to other coordinate global systems, but also to other even more encompassing systems: the modern world system and evolving human civilization.

This makes it plain how small a portion of a vast universe we are trying to penetrate. This analysis is situated in the global, that is, the topmost layer of the world system, and that defines our principal interest. Global politics are, of course, determined in part by global economics, and are oriented by global integration; these relationships will also be briefly alluded to. Most generally we must assume that each and every subsystem of the world system affects every other subsystem. But we cannot, at this time, pursue all the leads suggested by such a concept, e.g., regional systems, or national systems per se except insofar as they affect the global system (in which both the United States and the Soviet Union are, of course, intimately involved). But we will attempt to relate global politics to the movement of the active zone of the global system, in particular by charting the path of that zone in earth space.

The process of "embedding" might be conceptualized not just statically, as the coexistence of systems, but over time as an "ascending cascade," that is, a joining of greatly dispersed systems into increasingly larger ones. The analogy here being to galaxies that can be seen as "agglutination[s] of greatly dispersed dust particles into increasingly bigger pieces" (Mandelbrot 1983, 93). The contemporary world may be the product of such a process, and the process is an ongoing one.

All this makes it plain that the study of long cycles is, in fact, a species of *world* system analysis, the world system being the most encompassing social system that needs to be analyzed. The analysis is holistic not quite because the world system "determines" the behavior of its components, but because, as a concept, it is the most economical device for describing and explaining such large-scale behavior. Inasmuch as the world system partakes of social evolution, and inasmuch as social evolution, too, evinces recognizable patterns, the analysis may also, and profitably, be evolutionary.

One last principle of this analysis therefore is *self-similarity*. The world system is a composite structure or complex array of social systems of varying size. But all these systems may also be seen as structurally self-similar: they all exhibit concern with both external and internal problems and with questions of means and ends; hence, they obey or manifest the workings of the "four-function paradigm" (Parsons). Inasmuch as they are structurally self-similar, their structural problems are similar too, and as these problems have to be attended to over time in a regular manner, by a learning process that is akin to "political learning," they exhibit self-similarity over time in crucial aspects of their behavior.

Salient Trends

The Long Cycle

Our starting point is the long cycle as an observable and measurable pattern of regularity in global politics. The bare bones of that pattern were displayed at the start of this volume in Chapter One (Table 1.1), and need not be repeated here; they include the four phases into which each cycle may be divided, the major wars that are the high points of each cycle, the world powers that emerge from these global wars, and the contenders they must face sooner or later.

Table 1.1 summarizes the substance of long cycles; it tells us that, at the time of this writing, the global political system is in the phase of delegitimation, and it shows too, that over the next decade or two, that same system will pass into the phase of deconcentration. The phase of "global war" is not to be expected before circa 2030 and probably will not, therefore, have been reached by the year 2016. This captures neatly the outlines of the pattern projected for the next thirty years. In the next section, we spell out some more details of that projection and we supplement it with an "interface analysis" of related developments in global economics and in the world system.

Given these trends, certain *global* problems suggest themselves as likely to arise in the next few decades; on the other hand, we have little to say about regional or national problems. The major product of this inquiry is, therefore, a systematic specification of global problems for this and the coming generations.

Leadership erosion. The principal near-term tendency predicted by long-cycle analysis is the erosion of global leadership. This has two components: decline in the demand for leadership (delegitimation) and a drop in the supply of leadership (deconcentration). The theory predicts that delegitimation, the decline of legitimacy of leadership, anticipates deconcentration, that is, the dispersion of the global power distribution away from the unipolarity characteristic of a postwar world. Let us look at each of these in turn.

The current phase being that of delegitimation, its distinct characteristic has been an erosion of U.S. leadership. This process has been most apparent in the Third World, which is now thought to include Latin America (earlier in this century, regarded as belonging to the United States' very "own" hemisphere). The process reached a high point in the first and second oil shocks, the OPEC crisis of 1973-1974 and the Iranian revolution of 1979, and it was promptly echoed in several of the organs of the United Nations, including the General Assembly, in the demands for a new international economic order, and in the increased vigor of the nonaligned nations' movement. The same process has also been in evidence in Western Europe, and in East Asia, and in North America too--albeit to a less pronounced degree, but manifesting itself most commonly in a resurgence of patriotic sentiments. The partial erosion of U.S. leadership reflects the feeling that its original program, the consolidation of the post-war order, has been successfully accomplished, and the time has come to explore new problems and new challenges that might, or might not, require a change of leadership.

The other process is that of deconcentration. Over the course of each cycle, beginning with a condition of unipolarity at the end of each global war, the global polity gradually loses concentration by moving into bi- or multipolarity. At the end of World War II in 1945, the global system was, in respect of power, unambiguously unipolar; in the four decades since, it has transformed into a condition of bipolarity. The present analysis generates the expectation that, by 2016, the global political system will have experienced some additional deconcentration. The process of deconcentration became manifest with the Soviet Union's creation of a system of mutual nuclear deterrence in the 1970s. The power structure, which had been unipolar (or monopolar) since 1945 at the global level (although not at the European regional level), was transformed into bipolarity.

Figure 1.1, in Chapter One, captures that transformation; it depicts fluctuations in the index of global (sea) power concentration since 1494, and documents the dramatic rise in that index to 100 percent in 1945 (expressive of the United States' complete monopoly of sea power, embodied in aircraft carriers, at that point in time). By 1960, this index had already taken account of the development of nuclear missile and attack submarines. By 1978, the index moved into the region of bipolarity (.67), but it had not moved much further by the mid-1980s. In other words, as in the world economy, (as we shall demonstrate in a moment), the major shift had occurred by the mid-1970s; since then, the situation has been a fairly stable one. This means that deconcentration has been in progress. Are we to expect a continuation of that process in the next thirty years? The probable answer is: some but not much. Let us consider why.

Another close look at Figure 1.1 discloses that the U.S. cycle has been notable for the elevated level of global power concentration. The shift of world power away from Western Europe to North America in the twentieth century raised the stakes of world politics to a higher and unprecedented level. Global leadership now occupies a firmer and more entrenched base than ever before in the story of long cycles. Even though that high level cannot be kept "for ever" it could well be slower to erode than in previous cycles. In the first four cycles, the average rate of that decline was only .031 (that is, only three percentage points) in the years between mid-delegitimation and mid-deconcentration (Modelski and Thompson 1987). This was a not very considerable decline, but a downward slope nevertheless.

What might be the sources of such a decline in the next thirty years? Consider, in the first place, the United States and the Soviet Union, as the chief components of the global power structure.

For the United States, the 1970s were a period of rapid change and some retreat from world power. The past few years, on the other hand, have been fairly stable and afford little support for the post-hegemony thesis. The United States may be expected to continue in a global role well into the twenty-first century.

For the Soviet Union, the decade of the 1970s registered some notable gains, the most important of which has been the establishment of mutual deterrence. The question Amalrik asked in 1969, "Will the Soviet Union survive until 1985?" has, of course, been answered in the affirmative. (The great war with China that Amalrik saw coming by 1985 obviously did not materialize.) But the question has not completely gone away. R. V. Burks maintains that the chances are better than even that the Soviet Union, where

"Stalinist forced-draft industrialization has only temporarily created a superpower" will experience a "system breakdown" in the next five to ten years (1986, 305-320). By system breakdown, he means a political landslide brought about by economic failure, and comparable to the events in Czechoslovakia in 1968. While the late nineteenth century too saw a substantial decline in Russia's power--a product of its slow rate of industrialization as compared with Germany--and its current problems are great, its survival and global power status do not appear to be at stake, short of a major war that is not expected to occur within our time frame.

We have argued so far the relative stability of the power structure. What about an increase in the number of global powers (the G-number) from the present two to three or four, over the next generation? Four possibilities suggest themselves: China, India, Japan, and Western Europe (that is, the European Community; Britain, France, or West Germany individually do not appear likely candidates).

China indeed does raise important questions. At present, her population/resource ratio is quite unfavorable, but sustained economic development at the rate attained in the past few years and sustained over a period of two to three decades could make a difference. Current plans call for a quadrupling of the value of national output between 1980 and 2000; if that goal were attained, China's economy would then account for maybe 5 or 6 percent of world product (assuming a low growth rate for the world economy as a whole). But these same plans attach low priority to military expansion and do not constitute a design for a force of global reach.

Indian resources, while significant at the regional level, appear even more strained for a global role. The global reach potential of Japan and/or Western Europe, on the other hand, is quite considerable; but, of the four cases considered here, it is the less likely to be actualized in autonomous strategic programs in time for them to be significant by 2016.

Changes in the power distribution therefore promise to be slow and basically marginal in character. Looking thirty years ahead, one, or at most two, additions to the G-number (from two to maybe three or four powers) would not be altogether surprising, but, even then, we could not be sure that such a change would alter the bipolar pattern now prevailing. What about changes in the coalition structure of global politics? After 1945, the world settled into a two-bloc structure fairly rapidly, but superficially, in parts and, as decolonization made strides in various places, alternative forms of affiliation took root. In such organizations as the United Nations, in which the nonaligned bloc holds a dominant position in the General Assembly, a two-bloc structure can no longer be readily discerned. A U.S.-led coalition has remained basically coherent at its core and did not disintegrate in the face of the economic difficulties of the 1970s, but its predominantly European focus is now assuming a more global character. The coalition structure of the next generation will be heavily influenced by the problems that will need to be resolved in the coming cycle.

Some consequences. Assuming, then, a continuation of deconcentration, albeit at a slow rate, the consequences are likely to be a growing array of unsolved problems. In the past, deconcentration went hand in hand with increased competition for the role of global leadership that was due to be "vacated"; such competition delays essential decisions and the solution of global problems, in turn fueling a systemic crisis and structural weakness. It is not a sudden or a catastrophic breakdown; indeed, it might be an era of renewed economic growth. But an accumulation of unresolved crises and unmet problems signals a decay of leadership capacity and, for this, the period anticipating World War I offers the nearest precedent. In the run-up to that global conflagration, the Balkan wars, for instance, played such a role; Third World conflicts that are not contained by regional institutions could be of similar significance in the decades ahead, serving as the backdrop of distant thunder to a possibly prosperous and serene foreground.

A rise in the incidence and seriousness of conflicts reflects the declining effectiveness of the old system. Declining security for the operations of multinational corporations and of world transport routes has been one consequence. The terrorism of the last decade has been another. Massive wars, such as the Iraqi-Iranian one, as well as continuing armed conflict in several world regions, have become endemic parts of the world picture. Global data reported by Haas (1983) indicate an increase in the annual number of outbreaks of serious disputes from 2.3 in the years 1945-1960 to 4.4 in 1976-1981. A continued rise in the volume of international conflict might be expected, combined with the fact that, over time, the proportion of endemic and unresolvable disputes will also increase. Midlarsky (1984) regards this as an indicator of structural crisis that tends to be resolved by global (systemic) war.

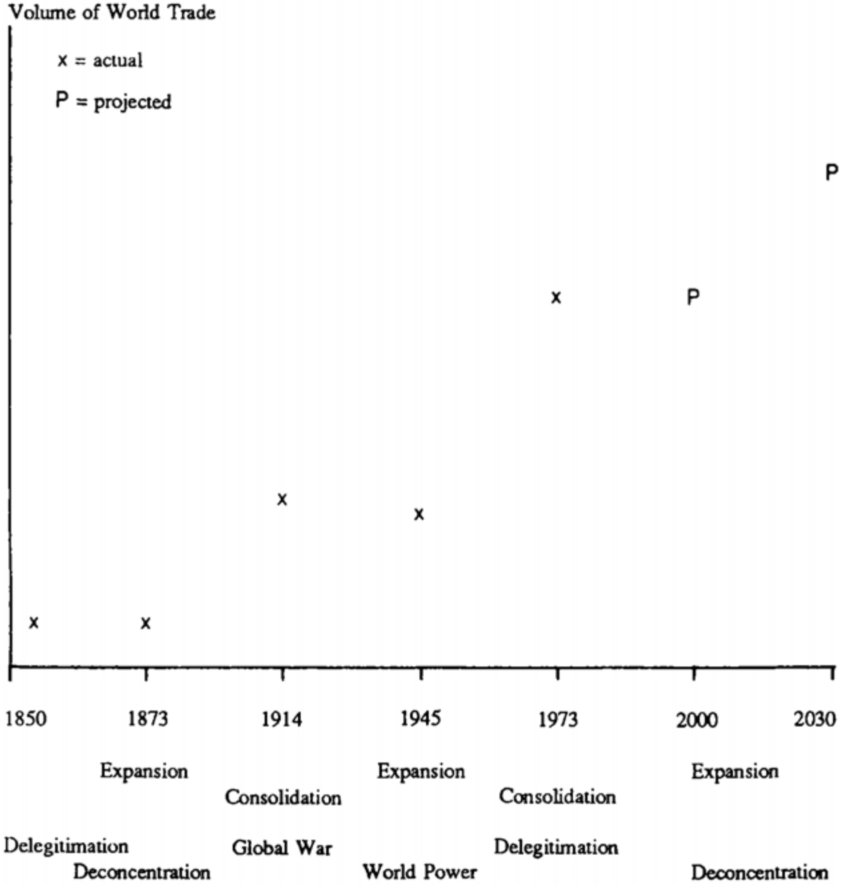
Global Economics Considered

A world politics scenario is incomplete without a consideration of prospects for the global economy. By that, we mean world trade, finance, aid and investment, and the world of multinational corporations--and, we postulate a systematic relationship at the interface between the global polity and the global economy, the two being, since 1500, increasingly differentiated subsystems of the global system.

Let us postulate, in particular, that the global economy is self-similar to the global polity, inasmuch as it experiences a learning cycle of a kind structurally similar to that of the global polity: one that is composed of two internal and two external phases. If we determine that each pair of phases are equal in length to one long-cycle phase (the global economic process being one-half the length of the long cycle), calling the internal phases those of consolidation, and the external ones those of expansion, we might then also hypothesize that consolidation is synchronized with the (politically active) long cycle phases of global war, and delegitimation and expansion with the (politically less active) phases of world power and deconcentration. The reason for thinking so is the concept of "alternation": periods of political activism do not favor economic expansion, but foster innovation; periods of political stability engender economic prosperity (Modelski 1981).

Such swings in global economic activity should be best observed in relation to world trade (which, in turn, reflects the activism of the leading sectors of the world economy) and the rise and fall of lead industries, geared to the movements of the active zone. Using the volume of world trade as an index of global economic activity, we observe (as shown schematically in Figure 9.1) that the global economy expanded rapidly in the decades leading up to World War I. The interwar period was one of stagnation, but trade shot up once again after 1945, levelling off in

Figure 9.1 A Model of the Politicoeconomic Interface at the Global Level



the early 1980s. Growth in the volume of direct foreign investment shows a basically similar trend. Multinational corporations are, indeed, important in the global economy but hardly "dominant"; theirs, too, is a world in which, following a period of rapid expansion after 1945, growth markedly slowed down in the 1970s.

Given our model, and these data, we predict the period of consolidation in the global economy to last until about 2000, to be followed by a surge of recovery and prosperity that might continue well past 2016. Consolidation is, in the first place, a period of levelling, in which the developed countries appear to reach a stable relationship with one another. But it is also an era of germination and preparation; it is the time for the exploration of new products and the founding of new industries. We cannot be sure what the new industries, which will dominate the era of expansion after 2000, will be but they might be in such science-based fields as information, telecommunications, bioengineering, or space. The location of the main centers of these activities will determine the movement of the active zone, and it is that movement that will express, and presage, the direction in world leadership in the next century. On this prognosis, the year 2016 could be situated amidst an era of great prosperity. Unless the optimism generated by economic expansion beclouds public judgement (as it might have in the halcyon years before 1914), the resources generated by these processes should make it easier to support and fund the schemes of political innovation that need to be put together, *inter alia*, if alternatives to global nuclear war are to be devised.

Trends in the World Economy

So far, our focus has been on the economy of global interdependence. We may assume that the world economy, as a whole (whose activity is measured by the world product, currently approximated by the sum of gross national products), trends roughly in the same general direction as world trade. When the world economy flourishes and the world product expands, commerce also rises; when the world economy languishes, so does its trade. But, of course, the several national economies' shares in the world product change, too, and thereon hangs another tale.

In the post-1945 world, a dominant factor in the world picture was the absolute size of the U.S. economy. Data in Table 9.1 make it evident that, in the immediate post-World War II period, that share was rather large; in the last decade, that share appears to have remained stable at the level of about 25 percent. But if an earlier baseline is used, say 1860, then the more notable trends are the decline of the Western European share and the spectacular rise of Japan from 1 to about 9 percent in the mid-1980s, set against the dramatic setbacks for both China and India. Interestingly enough, however, over this entire period, the combined weight of what today are the industrial

Table 9.1 World Product Shares (percent)

	1980	1913	1952-1954	1961	1975	1983	2000 (est)
United States	14	31	40	33	25	25	20
EEC (12)	35	30	18	20	21.5	20	20
Japan	1	2	2	3	7.5	9	10
	50	63	60	56	54	54	50
(OECD)					(61)	(61)	(55)[a]
USSR	7	7	13	16	14	14	10-12
China	20	8	4	4	2	3	5-6
India	10	6	3	2	1	1	2

Sources: For 1860, 1913, 1952-1954, L. J. Zimmerman, Arme en Rijke Landen, The Hague (1964) 169; for 1961, 1975, 1983, U.S. Arms Control and Disarmament Agency reports on World Military Expenditures 1971, 1985.

[a] OECD Interfures estimate (1979) was 50 percent for the moderate growth scenario.

Note: Data for USSR and China are less reliable than those for the United States, Europe, or Japan.

economies does not appear to have undergone a great deal of change.

As with world trade, our expectation is one of slow or moderate growth until about 2000. In the years between 1973 and 1983, since the first oil shock, the real world product grew at the rate of less than 3 percent per annum (and, in the four years 1980-83, by no more than a total of three percent). We project a similar rate of 2 to 3 percent per annum for another dozen of years or so, followed by a new growth spurt after 2000. In respect of national economies, the current shares may well remain fairly stable until after 2000 too, whereupon growth will be a function of implemented innovation. Among the developed countries, however, there could be a tendency for per capita income to converge on a standard distribution.

Spatial Sequence, and the Pacific Rim

One other aspect of the behavior of the global system that we need to consider is the movement of its active zone in earth space. The various elements comprised by the global system are not randomly distributed in a geographical sense but, rather, center on an area of high activity. That area shows a concentration of global actors and organizations, and exhibits high rates of innovation and investment. It is, at it were, the headquarters zone of the entire system. If, earlier, such a zone could be associated with a prominent city, as Fernand Braudel has argued, more recently, entire urban belts (or conurbations) and regions have been involved.

The seeds of the modern world system came up most prominently in Italy of the late medieval era, and most directly so in Venice of the fifteenth century. In subsequent centuries, the active zone moved in stages whose spatial path has been timed by the sequence of long cycles and, corresponding to which, has been a succession of world powers and consequently also of "world cities": Lisbon, Amsterdam, London, Manchester, New York/Washington.

The prominent trend has been patently westward (Modelski 1986b). Such a trend is now observable in the United States, in the same way that a north-to-northwest movement was observable in Britain, circa 1800. "In 1980, for the first time in the history of the United States, more Americans were living in the South and West, 118 million, than in the East and Midwest, only 108 million." This "North-South" shift, one of Naisbitt's (1984, 232, 234) ten megatrends "is really a shift to the West, the Southwest, and Florida." By the year 2000, Los Angeles will be the largest metropolitan area in the country and the largest port; San Francisco will be the area with the highest personal income.

Although, in the United States, this shift is sometimes called the drift to the sun belt, it may also be seen, in global perspective, as a westward movement basically toward the Pacific Rim. Its major impact is felt on the west coast because of the rising wealth of Japan, the rapid growth of the newly industrializing countries of Asia and Hong Kong, the Soviet Union's drive to their east and, last but hardly least, the tantalizing potential of China (to incorporate Hong Kong by 1997). These developments are moving the active zone of the global system from the northeast United States in the direction of the Pacific coast. Expectedly then, by 2016, the positive center of the world system will have moved significantly westward, and the "Age of the Pacific" may have come closer to realization.

World System Trends

So far, this analysis has spelled out the implications of the long cycle as a process animating the global political system and, more generally, the global system. But if these are, in fact, embedded in a larger, encompassing system, then they must also be affected by, and in phase with, the operation of that larger system. Moreover, if that larger system, while different in scale, is self-similar to the systems it contains, then its functioning might also exhibit the same behavioral tendencies. Let us then explore a few implications of such assumptions for our capacity to anticipate developments in the next thirty years.

The world system is the social organization of the human species. Broadly following McNeill's account (1963), we might date its inception to the fourth millennium B.C. and the rise of the Mesopotamian civilizations, which soon produced offshoots in the valleys of the Nile and the Indus. We might then view the rise of human civilization (or the civilizational process) as a succession of major waves or epochs, of which the first constitutes that of Middle Eastern dominance and the second, that of Eurasian cultural balance. The third, the one we are experiencing, is the modern epoch that crystallized around 1500 but whose inception might have occurred as early as 1000 A.D. As we look at each of these epochs, including the current one, we observe within each one of them a succession of developments of remarkable complexity, yet also coherence. For the modern one, the span between 1000 and 1500 could be regarded as one of incubation and gestation of modernity, both in China and in the Eurasian Far West, especially Italy. The era of Western European dominance (1500-1945) forms another distinctive period, whose main achievement has been the integration of the diverse civilizations of the old and new worlds into one global system of nation-states. The most recent ("post-European") era is one of the definitive shaping of that modern system and the testing of its capacity for adaptation and change.

If, on the strength of self-similarity, we postulate that the world system, as a whole (and not just the global polity and the global system), is subject to learning--albeit of a rather long-range character--then two such processes might be distinguished: the civilizational process, describing the evolution of the world system through its major epochs; and the operating process, describing the fluctuating movements (or successive eras) of the world system itself in each civilizational epoch. In respect of both processes, the world system is now in its third phase, one that can most generally b~ described as "decisional," or political in the sense of conducive to the reaching of "binding decisions" or having the character of goal attainment (Parsons).

In the two earlier epochs of the world system, the decisional phases of each of them could be seen as eras of testing and retrenchment, if not relapse. "Beginning about 1700 B.C.," writes William McNeill (1963, 125), "a wave of barbarian invasions initiated far-reaching changes in the political and cultural map of the Middle East," then the center of civilization. In the late fourth century A.D. "the balance of forces [across] the long frontier between civilized and barbarian peoples that ran all the way from the mouth of the Rhine to the mouth of the Amur . . . changed decisively" (ibid., 395). While in the longer-run perspective, these processes could be regarded as those of the spread of development or even of dependency reversal, both were, in the shorter run, profound setbacks to progress and brought in their train the fall of the empires of the Romans and of the Han, whose ruins have not ceased to remind us of the precarious nature of civilization. Is a similar set of setbacks in store for the modern civilization that entered the decisional stage in the twentieth century, especially if problems of dependency and its reversal go unattended and remain unresolved? In the civilizational process, furthermore, are we not now confronting the question of world survival?

Problems and Solutions

Delegitimation and deconcentration are only one half, the "downside" part, of the story generated by this theory. The other part of it is just as important and has more of an upbeat tone to it. It declares that, side by side with signals of deterioration and symptoms of decay, the global political system also displays, for those who know where to look, evidence of new conceptions and imaginative constructions that can lead to new conjunctions. Consider the decades prior to the Napoleonic wars: Britain then experienced great domestic unrest and the shock of losing much of its empire to the newly independent American colonists, but it also gave birth to the Industrial Revolution.

Consider too the late nineteenth century: the retreat of British power moved in step with the rapid rise of the United States not only as a major industrial center, but also as the future base for an information revolution. In other words, the two long-cycle phases we have identified in Table 1.1 as those of delegitimation and deconcentration, can with equal justification, in the perspective of the next cycle, be called those of clarification and coalitioning--clarification, because the delegitimation of the old order goes hand in hand with the definition of the new problems that lie ahead; and coalitioning, because the approaching competition for leadership to solve these problems calls for a reshuffling of alignments, and the working out of new coalitions, possibly by new actors, thereby laying the foundations of relegitimation.

What is it that justifies this novel conceptualization? It is the conception of the long cycle as political learning, a process that alters and reconstructs the system that experiences it. The phases that in Table 1.1 appear as those of decline, assume, in this perspective, a new significance and become just one side of a more complex coin, as was already seen in Table 1.2. In this "learning mode" we would expect the global polity to have moved, by 2016, from the phase of clarification into that of coalitioning. The clarification of global problems will have provided the basis for the rebuilding of legitimacy in the phase of coalitioning. But clarification of what and coalitioning for what?

Clarification is recognition and definition of systemic problems, and coalitioning is organizing to cope with these problems. These are not just names of phases of the political learning cycle; they are two of the basic mechanisms of the global polity reaching out for solutions. What are the problems that will need to be processed by 2016?

Global Political Problems

Long-cycle theory suggests two sets of problems that will need to be resolved by a global macrodecision: (1) specifically political problems, that is, those arising out of the functioning of the global polity; and, (2) more broadly global problems linked to the leadership role of the world power. The utility of long-cycle theory lies in the fact that it defines and anticipates the problems that are likely to arise in the long-term functioning of global political and social systems. (This makes it, incidentally, a necessary part of the current phase of clarification). The priority problems for the next generation, and for the next learning cycle are presented below.

First, the principal political problem for the current learning cycle (Cycle 2 in Table 1.2) is that arising from the solution of the last cycle's major question. The global *problematique* of the last (learning) cycle was the Knowledge Revolution (Modelski 1986)--that, in turn, was made possible by the Industrial Revolution that laid the industrial and resource base for translating knowledge into action. The Knowledge (or information) Revolution has reshaped our view of the universe, transformed global communications, and explosively enlarged the base of world culture. It also created the scientific-technological-industrial complex that gave birth to nuclear weapons. It is now becoming increasingly obvious that nuclear weapons render obsolete the global war that in recent centuries has served as the decision mechanism of the global polity; since their use would threaten the survival of the human species, their use can no longer be rationally contemplated in a process of global decision making. The most pressing political problems awaiting solution in the present learning cycle are the intertwined issues of global war and nuclear weapons. By 2016, these will have become the principal orienting element of global political coalitions.

Talks to achieve international control of nuclear weapons have been, of course, a significant element of the American-Soviet relationship since 1945. Their highlights include the Baruch Plan (1946), the McCloy-Zorin scheme for general and complete disarmament (GCD, 1961) and, most recently, the Geneva talks, including the Gorbachev proposal of January 1986, for the "complete elimination of all nuclear weapons throughout the world" by the year 2000.[1] Quite evidently, the problem has not been ignored in diplomatic practice; but, it has been plagued by platitudinous agreements on ends (peace, general disarmament, nuclear-free world) and serious and persistent disagreements about mechanisms and means. It is the ends-means nexus of these arrangements that needs to be rethought before such talks can exert a significant impact on avoiding the next global war.

Second, going beyond the purely political to the general problems of global organization, it can again be deduced from the theory of long cycles that the major *problematique* of the current process will revolve *not* around "information" or, more generally, culture-maintenance, but around the next great problem area in the global learning sequence, that of integration and solidarity.

Why this should be so is, in part, a consequence of the achievements of the last cycle that shifted the locus of global leadership from Western Europe to North America and gave integration and solidarity a continental and not just a parochial European basis. This "continentalization" of global leadership in the post-European era was the creation of a higher form of organization that now calls for a new, enhanced level of integration to support it. The rudimentary network of solidarity put in place, four centuries ago, by the Dutch cycle, is no longer fully operative. It needs broadening and reworking, and not just because the Knowledge Revolution has laid down the infrastructure of languages and communications and clarified the scope of the community that is needed to glue together the global system and make the world cohere. Even more important, the world's population has risen more than tenfold, by an entire order of magnitude in that time span, from 450 million in 1500 to maybe six billion by 2000. According to a recent World Bank estimate (cf. Appendix) that figure might reach ten billion by 2050, by which time the developing countries' proportion of world population, now 76 percent, will have risen to 85 percent.

Many observers view the North-South conflict as an enduring characteristic of, and as a symptom of, the lack of integration in present-day international relations, but not all maintain, as does Stephen Krasner, that this might be a problem "for which there are no solutions" (1985, 314). What might be the components of an "integrative revolution" in the twenty-first century? Some will have to be invented between now and the next century, but there will probably be several. What has, so far, been the core of global solidarity is sure to be extended beyond the shores of the North Atlantic to the Pacific and the other major regions of the world. It will be based on the rising level of global interactions created by improved communications. It will nourish a global elite structure based on common sources of higher education, and it might involve communities of democracy and the forging of coalitions based on democratic principles.

Let us note in parentheses that the Soviet Union's claim to global leadership derives, in part, from asserting a variant of international solidarity. "Workers of all countries, unite" is the closing and the most powerful slogan of the Communist Manifesto. On its basis, the Soviet Union serves as an organizing focus for the world Communist movement; that is, in turn, one of the bases of the legitimacy of the Soviet regime.

These two major global problems, those of nuclear war and of global solidarity, are, as noted, closely intertwined: the advent of weapons of mutual annihilation generates the potential for the common interest in avoiding their use, and produces the understratum of global solidarity that is a precondition for solving the problem of global war. That latter problem, in turn, arises because the contemporary solution to the problem of these weapons, nuclear deterrence, which is the design for keeping the peace by the threat of retaliation and mutual destruction, cannot be the lasting solution (Modelski and Morgan 1985). That is so for at least two reasons. At the level of common sense, we cannot accept as permanent a system that keeps global peace only by continual risk to planetary survival. More important yet, nuclear deterrence is not a substitute for the global war: its only virtue is that of temporarily deferring a decision that would otherwise be made by the use of force. Indeed at Geneva, in November 1985, the United States and the Soviet Union agreed in their joint statement that "a nuclear war cannot be won and must never be fought"; they added that they "will not seek to achieve military superiority."

But if world politics, as all politics, is not just about cooperation but also conflict, and about winning conflicts, and hence also about superiority, and if winning a global war by military superiority has been the traditional (and necessary) mechanism of macrodecision, then it also follows that deterrence, which is an architecture of stalemate, cannot by itself serve as an alternative method of global decision making but only as a temporary window of opportunity for creating a substitute mechanism.

There is yet another level of synergism to bear in mind.

As argued in the section on world system trends, the world as a whole, and not just its global layer of interdependence, faces two problems in its own functioning: unequal development, and therefore the need for correcting that condition, and the survival (or at least a macrotest of survival potential), of human civilization. That is how, in an intricate pattern, the global political problems reflect, repeat, and reinforce these broader tendencies: the purely political problem of finding a substitute for global nuclear war is raising the issue of survival; the issue of global solidarity bears directly on, and lays the groundwork for, dealing with the question of inequality and of the delayed costs of development.

What about problems that are other than, broadly speaking, political (that is, those arising from the functioning of systems other than the global polity)? In recent years, the concept of the global problem has been linked principally to a series of conditions that might generally be described as environmental. The nuclear war problem is, of course, the most dangerous environmental problem of all, but there are others: overpopulation, pollution, food and energy, urbanization, desertification. There is also the question of global climate change consequent upon the "greenhouse" effect. All of these are, to some large degree, the products and the costs of the Industrial Revolution, as well as the more recent recognition of the finiteness of the earth's resources, and they are also to some degree the problems of the global economic and other systems. But care needs to be taken about pinning the label of global problem all too freely onto a large number of problems and thus diminishing the sense of urgency that must attach to the most important of them.

There are many problems of broad scope that are of diverse incidence. Population, for instance, is undoubtedly such a problem in some countries but not in others: whereas China's priorities seem bent toward rigorous control, some parts of Western Europe now have stationary populations; for the world as a whole, the population growth rate has recently been declining. The rise of huge cities must, in the first place, be tackled by the countries in which they are situated. In other words, caution must be the rule in directing global attention not just to widely prevalent problems, but only to those problems that are susceptible to treatment, and that truly need to be treated, at the global level.

This leaves us with the two principal global political problems: those of avoiding nuclear war and of reconstructing global solidarity. It is argued that these will be the problems that will dominate the demand-side of global politics in the next generation or so. Only those capable of dealing with these problems, and those most capable of solving them, will have a good claim on future leadership.

The Global Decision Process

Both these problems will be part of the political process, and well understood, by 2016; but, they will not be fully resolved. The reason is that problems of that caliber are not resolved overnight, or even in a decade, but need to be recognized, accepted, ratified, and implemented through an extended learning process. The nature of that process becomes, at this point, a major consideration. In the experience of long cycles to date, the centerpiece of the systemic process of macrodecision has been the global war that followed upon the phase of deconcentration. Must there be a global war to decide upon the issues that will face the global system early in the twenty-first century?

In the "normal" course of international events, a global war could be expected to occur sometime after, shall we say, 2030. That is, of course, quite a long time away and beyond even the generation-spanning target date of this paper. If this means that such a war is not imminent, it also follows that nuclear deterrence has had little to do with the absence of global war in the past forty years and that it is unlikely to have all that much to do with its avoidance in the next forty years.

The long cycle predicts global war because such a major test of strength is a fitting conclusion to the phases of delegitimation and deconcentration, when a decaying system is slowly winding down. In the learning process, moreover, the global war is the mechanism that crystallizes and ratifies the phases of clarification and coalitioning, the winning coalition of the global war being the one that will administer the postwar system. The learning process *requires* a decision mechanism and a macrodecision because the global system *needs* leadership, and because a choice *awaits* to be made among basic policies; the mechanism selects a country (or countries) for leadership, but not others; some policies prevail, while others do not. An anarchical system devoid of leadership cannot be seriously contemplated for the future, just as it has not been in evidence in the past. But, although the global war has been the win-lose decision mechanism of the past, nothing in the logic of the situation requires us to argue that it must remain so in the future.

By 2016, it should be fairly clear whether there will or will not be a "next" global war. If the world will have begun to build an alternative mechanism for global decision making, then the likelihood of it occurring will decline. We have already noted the synergy between the major global problems. The global war needs to be tackled because nuclear weapons make another global war unthinkable. That, in turn, is an irrefutable foundation for broader integration: the "we are all in the same boat" argument creates the framework of common interest that will underpin the new networks of global solidarity. On the other hand, the prospects for a new decision mechanism must already be visible by 2016. If they are not, pressures for a return to the traditional, and more primitive, methods of the past might well become irresistible.

What might be the nature of the substitute mechanism for macrodecision? François Perroux conceived macrodecisions as "the struggle for the fixing of the rules of the game"; the clearest case of a political macrodecision is a "critical election"; a good example of a systemic decision mechanism is an electoral system sturdy enough to execute a critical election. We do not really know what a substitute mechanism for global war might be like because that will be the result of substantial political innovation. It could, conceivably, have the format of simulated combat, which is what an election is in any event. But the innovative effort will be so substantial that it may be expected to require more than a generation to gain acceptance, and another generation for testing and for implementation in the practice of world politics. It is likely that the long-cycle phase following upon deconcentration/coalitioning will be such a testing period for the acceptance of the innovation that will select new global leadership and decide among alternative global policies.

All that we can say about it at this time is that it will have to meet certain design specifications:

1. It will be evolutionary, rather than revolutionary; i.e., it will not be too different from what the global polity has experienced since 1500, but will include modifications necessitated by more recent developments, including "continentalization", and the expected growth in solidarity
2. It will resolve the global war/nuclear weapons problem
3. It will provide for nation-state type of leadership, likely modified by features of coleadership
4. It will provide for leadership selection, based on an agenda of global policies, and a known allocation of burdens and an agreed-upon distribution of privileges
5. The outcome of the global macrodecision (winning leadership) will be separated from conditions at the national and regional levels; that is, losing globally cannot mean forfeiting national independence or regional integrity

Could it be that the innovative solution satisfying these criteria might be an encore performance deliberately staged?

Embryos of Evolutionary Development?

Long-cycle analysis suggests that delegitimation/clarification is also the incubation period of innovations likely to be significant in the next cycle. What might have been the sources of such evolutionary developments in the years since 1973, and are they likely to gather strength? Let us briefly consider three of these: developments in the oceanic (or Western) grouping--in particular the seven-power summits, the superpower summits, and regional arrangements.

In recent decades the oceanic coalition has registered steady gains by inclusion, specialization, and evolutionary transformation. A successful instance of the last-mentioned process is the institution of the seven-power (so-called economic) summits (Putnam and Bayne 1984) that, since 1975, have brought together for annual meetings the heads of government of the chief industrial states of the West (the United States, Japan, West Germany, France, Britain, Italy, and Canada). These initially quite informal meetings, whose venue has rotated among the seven participating countries, experienced increasing institutionalization and now attract large delegations from the ministries of foreign, financial, and economic affairs, and considerable attention from the media. The work of certain other bodies, including the European Community, the OECD, GATT, and the International Monetary Fund, is also geared to them.

The seven-power summit is an advance upon previous methods of policy coordination in the Western system, and an experiment in coleadership. At its origin, it expressed the shift in economic power in the Western camp that had occurred by 1975 (cf. Table 9.1). It is a global-level institution, in the form of a "directorate," meeting regularly and capable of taking a broad view. It brings together those responsible for more than one-half of the world product, for the seven principals' weight in the world economy has, so far, remained steady at about 55 percent. Attended by heads of government, it lubricates relations at the highest level and lends itself to high-level policy direction and initiative. (The "Group of Five" finance ministers, enlarged at the 1986 Tokyo summit to seven, has recently emerged as a more specialized organ of Western economic cooperation and a medium for managing economic policy on behalf of the political leadership. This could allow the summit to concentrate more on political issues proper.)

The seven-power summit is an institution of the bipolar global system, even though its political and strategic functions are, at present, only secondary. It has shown capacity for evolutionary adjustment (but little capacity for long-term planning), and has weathered not only at least one major diplomatic crisis (the failure of the 1982 Versailles meeting over East-West trade questions), but also, just as important, more than a decade of the recessionary process of consolidation, which some observers thought might bring about the collapse of Western alliance. Remember "The Disintegrating West" (Kaldor 1978)? As long as both the West European powers and Japan continue to participate in it effectively, a movement toward autonomous political postures (that is, toward multipolarity) is less likely. Its breakup, on the other hand, would be a leading indicator of fracture in the oceanic system. Given its success so far, the prospects are that it will strengthen in the years ahead.

The U.S.-Soviet (superpower) summit, on the other hand, practiced on a bilateral basis in eight meetings between 1959 and 1986, has remained a sporadic and so far uninstitutionalized affair. The November 1985 Geneva decision to have two more follow-up sessions was a step in the direction of institutionalization, but its implementation has so far been far from smooth. The superpower summit, too, embodies bipolarity, but is it a mechanism for global decision making? True, at Geneva, the United States and the Soviet Union reaffirmed their "special responsibility . . . for maintaining peace," and their preoccupation with arms control shows that the summit is charged with the nuclear problem but, so far, their success in dealing with it has not been outstanding.

The third noteworthy tendency is the growing strength of regional systems of organization. The collapse of traditional empires in Asia and the Middle East left a vacuum of authority at the turn of the twentieth century that was filled by Britain and, later, partially, by the United States; but it also became a source of disruption. Since about 1970, the trend has been toward an increased role for conflict resolution at the regional level (Haas 1983) and for the growth of significant regional organizations in Western Europe, Southeast Asia, South Asia, and perhaps also Africa and Latin America. This takes some load off global leadership, and lays the basis for a more complex world structure appropriate to modernity.

One other tendency to watch is the evolution of an increasingly autonomous global layer of organizations in and around the United Nations system.

The Question of Global Leadership

The basic schema of long cycles as presented in Table 1.2 implies that the question of global leadership in the twenty-first century will not yet have been resolved by 2016. The phase of deconcentration anticipates the coming struggle for leadership and, in coalitioning, lays out some of the groundwork for that struggle; but, by itself, it does not resolve it. However, some questions remain:

1. Why, in the first place, should the world of the twenty-first century require world leadership, and challengers, of the kind we have known in the past several centuries?
2. Even if it does, may not this question have to be decided earlier, maybe even before 2016?
3. Even if the question is not decided earlier, what if global war is no longer the relevant decision

mechanism?

4. Finally, what might be the criteria of eligibility for global leadership in the next century?

1. The need for leadership. Like every social system, the world and its global system need leadership. The real issue is the form or manner in which it is provided. Has the world system evolved so far, and have we grown so sophisticated that the successful (although not uncontested and fully legitimated) nation-state type of leadership, provided in the last five hundred years by a series of oceanic states, is now outmoded? Has the world outgrown this possibly crude mechanism of social coordination, one that labors under the constant disadvantage of needing to disentangle the national from global functions and interests? Might not the posthegemonic era be one of cooperation rather than leadership? No, for two reasons. In the first place, there is, at this time, no viable alternative. Whatever its merits as a world forum, the United Nations cannot be regarded as a primary mechanism for global problem solving. It is not a world state, nor indeed has a persuasive case been made that a world state is the appropriate solution in this particular case.

Second, and more important, the institution of the nation-state lead unit represents more than just an assertion of power. It is a reference point for a web of relationships that compose the substance of the global system and that, at the right time, can be focused on the solution of a broad range of world problems. It is not just a concentration of military power but, rather, an assembly of an entire package of the right "factors of production" ranging from innovative industries to intellectual resources of global experience and understanding. The range of problems that might be expected to be tackled by global leadership, and against significant opposition, cannot be mastered by the resources of any single organization, but requires a panoply of groups, networks, institutions, and interactions that do not follow any single command but do require a supportive framework. On the other hand, such resources need not be overwhelming; none of the world powers of past experience in any sense controlled the world or even its wealth, and it is not to be expected that the next world power will. All that is needed is a basic package clearly relevant to the problems at hand.

There is no reason to think that the nuclear problem can be resolved without the participation of the states holding the major arsenals. Integration, too, must be spearheaded by major countries' institutional complexes. In past cycles, leadership did, in fact, benefit from the specific cooperation of certain key states--not from cooperation at the universal level but, rather, from coalitions and special relationships with selected countries. The Anglo-Dutch alliance, and the Anglo-American "special relationship" are the prime examples of what was, for significant periods, effective coleadership. These are the examples by which what basically was "singular" leadership was broadened, and might again be broadened in the future.

In a longer time frame, vertical differentiation may indeed reach a level where the four layers of the world political structure (from global to local levels) may be more clearly separable and acquire their own autonomy. Even then, it is not entirely obvious why a global political authority should be invested with the monopoly of the means of violence. Nation-state leadership will need to remain as the anchor of such arrangements for at least the period we are considering. But, as long as it is remembered that the purpose of leadership is the solution of global problems, increasingly elaborate and formalized structures of coleadership can be fitted into it as might be required by the tasks at hand.

2. When to make the decision. If the world needs leadership, of the "traditional," nation-state variety, although tempered by features of sharing, might not the question of "succession" be settled earlier than projected here, even before 2016? Why do we have to wait for another generation, and then undergo what looks, at present, like a lengthy, costly, and conflictual selection process for arriving at what is, possibly, a simple decision?

In the first place, because a massive learning process is involved for the unfolding of which time is required, and for which the education of at least one new generation must be undertaken. Lessons of past global wars will have to be "learned" (or "unlearned"), and new lessons will need to be absorbed. This is time consuming, yet we must also bear in mind that those who will hold power in 2016 have most probably already been born, and are now receiving their first training and will soon be sitting in their classes and building up their images of the world. These, in particular, need to be clear about the options that are available so that nuclear global war is not regarded as the normal or even ultimate method of reaching macrodecisions.

More fundamentally, however, the decision cannot be reached sooner because the substitute mechanism of global decision making is not yet in place. The only other way of taking that decision would be by premature global war. If that is ruled out, as it must be, then an alternative mechanism must first be found. But we have already seen that its creation will, by and of itself, be a major feat of leadership and thus, for one more reason, the selection of new leadership cannot be separated from the problems that await solution.

3. A relevant decision mechanism. What if global war is indeed allowed to wither away as the appropriate mechanism for global decision? Does that not by itself change significantly the entire process? Does it mean, for instance, that military power will no longer be relevant in world politics? That, if we sit out this transitional period of "moratorium" we shall, in any event, be ushered into a world in which the great nuclear forces of the superpowers will have atrophied into insignificance?

The question is an important one and has many facets. One of these is the time dimension. In our present analysis, this would not occur until well after 2016 because, until and unless a substitute mechanism of decision making is in place (and, as argued, we do not expect this to occur before that date), the "traditional" functions of the nuclear arsenals will remain. The other facet is the role of military power at the global level in a situation where the global war is no longer a mechanism of macrodecision making. We would not expect that role to disappear altogether because global order will continue to require protection from disruptions, but we would expect some important changes in the components of the forces of global reach.

4. Eligibility criteria for global leadership. In this analysis, the criteria of eligibility for global leadership in the next cycle will not be drastically different from those that prevailed in recent cycles, and they will determine which of the global powers (reviewed earlier) will, in due time, succeed to the role of leadership. As argued elsewhere (Modelski 1987), the "traditional" criteria are: an insular position (yielding surplus security, and a global orientation); an open (and alliance-capable) society; a lead economy and an array of forces of global reach. Patterns identified in earlier cases, such as coleadership, evolving complexity, and encore performance (as evidenced by Britain's self-succession over the course of two cycles) will continue to be relevant. But these "factor inputs" and patterns will also stand in some determinate relationship to the global problems that await resolution; they must furnish the resources appropriate to the solution of problems previously identified as decisive: the global nuclear war and integration.

Outlook

Let us summarize briefly our scenario for 2016. The prospect ahead is for relative stability of the bipolar world political structure, with only moderate deconcentration and some rearrangement of alliances, and for a relatively calm and prosperous global economic outlook in the early twenty-first century. We do not expect a global war in that time frame, although local and regional conflicts may gain in intensity.

These conditions, in turn, favor the emergence of renewed leadership. Its waning strength will be relegitimated by proposing and implementing an appropriate agenda for the pursuit of critical global problems. Our analysis highlights two such sets of problems: (1) those centered on the prevention of the next global (nuclear) war; and (2) those of integration at the global level, to build an infrastructure of global solidarity in order to create conditions for dealing with, *inter alia*, the North-South problem.

A global politics scenario therefore reduces itself to a definition of problems that need to be pursued on a priority basis in the lifespan of the coming generation. Leadership, and coleadership too, will be attained by those effectively pursuing these problems.

Chapter 9 Appendix
World Population Projections

	1982		2000		2050	
	In Millions	Percent of World Population	In Millions	Percent of World Population	In Millions	Percent of World Population
World population	4,556	100	6,082	100	9,800	100
United States	232	5	259	4	300	
Japan	118	3	128	2		
European Community (12)	320	7				
USSR	270	6	306	5		
China	1,008	22	1,119	20		
India	717	16	994	16		
Developed countries	1,100	24			1,400	15
Developing countries	3,500	76			8,400	85

Source: World Bank, World Development Report for 1984.

Notes

An earlier version of this paper was presented at the Symposium on the International System, Tokyo, March 24-26, 1986.

1. At the October 1986 minisummit held at Reykjavik, Iceland, the surprise was the seriousness with which both sides discussed extremely drastic reductions in nuclear weapons. President Reagan's final, "revised" proposal provided that "by the end of 1996, all offensive ballistic missiles of the USSR and the United States will have been totally eliminated" (New York Times, 18 October 1986, 5).

A Bibliography of Long Cycles, 1975–1985

This is an annotated bibliography of long cycle-related writing brought out between 1975 and 1985. It lists the books and articles that have appeared in print, as well as conference papers and graduate dissertations, but it excludes working papers, seminar presentations, and drafts or proposals that have not had public circulation. Each entry represents the first appearance of a particular work in the public domain and follows it through its publications history; it also presents a terse summary of the argument. The bibliography expands on and brings up-to-date an earlier version, which appeared in *International Studies Notes* in 1983.

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